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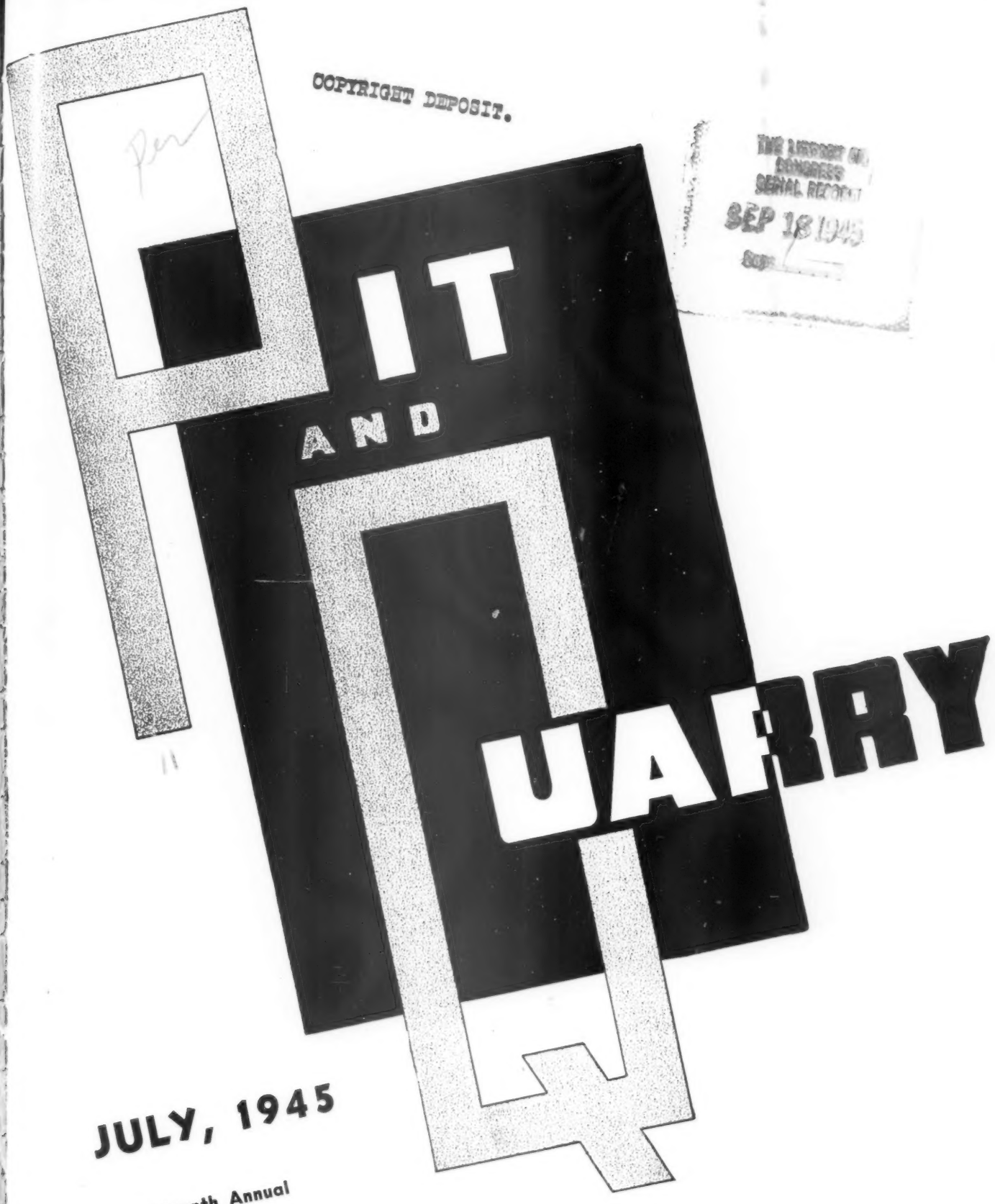
THE LIBRARY OF CONGRESS SERIAL RECORD
SEP 18 1945



JULY, 1945

Seventeenth Annual
Cement-Mills
Number

TOTAL NET PAID CIRCULATION NOW AT NEW ALL-TIME PEAK — OVER 7,500

FOR 28 YEARS THE LARGEST PRODUCER CIRCULATION IN THE FIELD

SEP 16 1945

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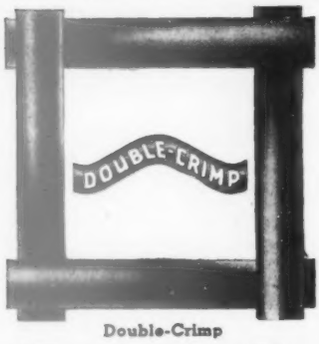
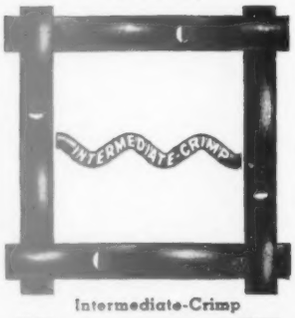
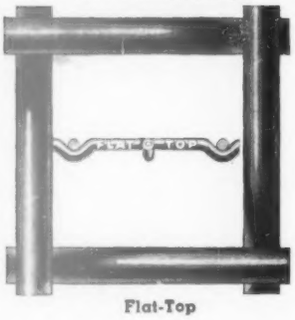


Double-Crimp

Arch-Crimp



Intermediate-Crimp



Flat-Top

"The Perfect"

Wire Cloths and Screens

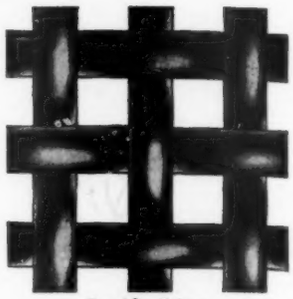
We have been specialists for many years in the making of precision wire cloths, wire screens and woven wire products.

We apply our same precision principles in fabricating wire cloths into finished industrial units, for production or processing equipments or for permanent parts of countless industrial products.

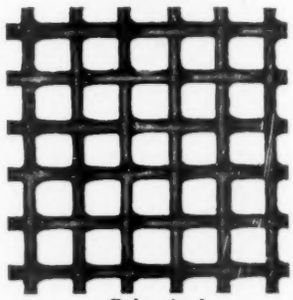
We invite your inquiries for wire cloths of all commercial metals or alloys or weaves, in continuous lengths or cut to size, or processed to meet your individual requirements.

"Perfect" alloys and metals	"Perfect" Wire Cloth weaves	"Perfect" Wire Cloth Processing	"Perfect" Wire Cloth products
Super-Loy	Arch-Crimp	Bending	Baskets
Steel	Coiled	Binding	Circles
Galvanized	Double-Crimp	Brazing	Cones
Tinned	Double-Fill	Calendering	Crates
Stainless Steel	Dutch	Clinching	Cylinders
Nickel-Chromium alloys	Filter	Cutting	Discs
Aluminum	Flat-Top	Dipping	Forms
Brass	Herringbone-Twill	Dishing	Leaves
Bronze	Intermediate-crimp	Flanging	Lengths
Commercial Phosphor	Rek-Tang	Flattening	Panels
Copper	Selvage-Edge	Forming	Pieces
Monel Metal	Straight-Warp	Framing	Racks
Nickel	Stranded	Galvanizing	Ribbons
Any special alloys available in rod or wire form	Sta-Tru	Painting	Rolls
	Triple-Warp	Shearing	Sections
	Twilled	Slitting	Segments
	Twisted-Fill	Trimming	Spaces
	Twisted-Warp	Arc-Welding	Strips
		Gas-Welding	Template shapes
		Spot-Welding	Trays

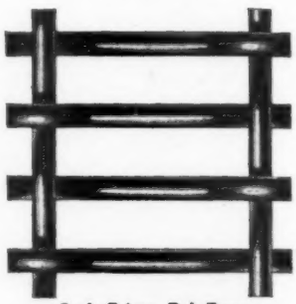
We will follow your specifications and blue-prints exactly as your production engineers have prepared them—or we will submit suggestions for your approval.



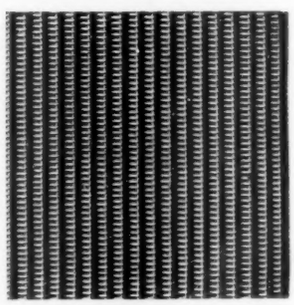
Double-Crimp



Galvanized



Arch-Crimp Rek-Tang

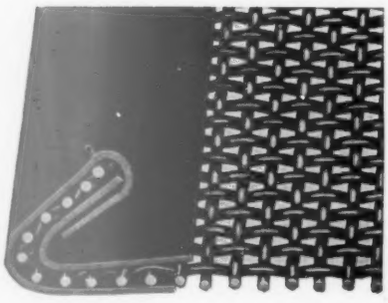


Dutch Weave

The LUDLOW-SAYLOR WIRE COMPANY

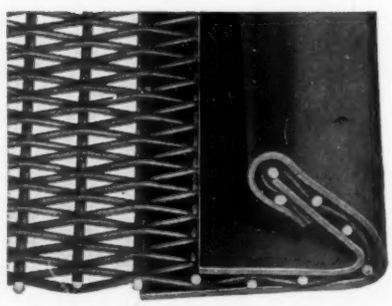
Newstead Avenue & Wabash Railroad

ST. LOUIS 10, MO.



LUDLOW-SAYLOR PRECISION FABRICATING makes vibrating-screen decks and jackets that are easily handled — quickly installed — need fewer adjustments and renewals.

Illustrations suggest only a few of the many available types of wire cloths and woven wire screens, which may be custom-finished with attachments to fit your particular processing installations.

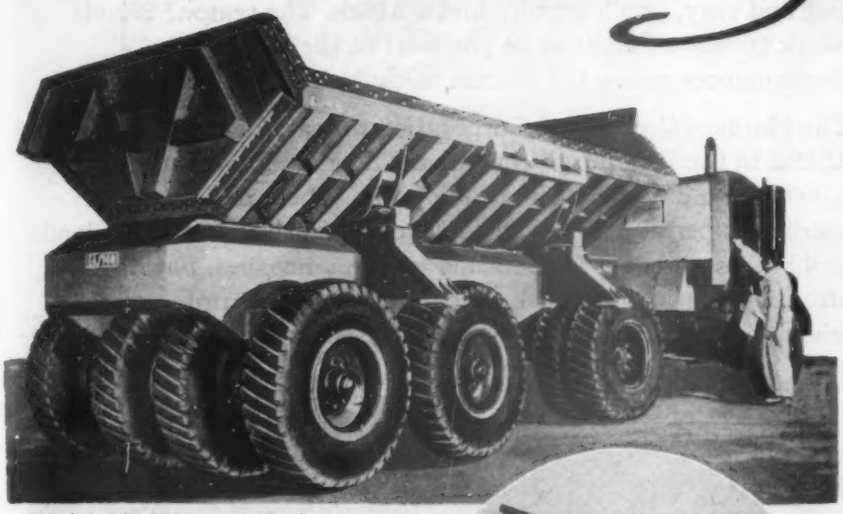


NOTHING HAS BEEN *Subtracted*

EASTON's store of "know-how" on haulage problems has grown even greater during the War. Many new and unique designs are today showing the way to high production and low costs.

EASTON has the answer to most haulage questions . . . especially those involving such factors as track gauge, body type, method of dumping, size of tires, type of prime mover, etc.

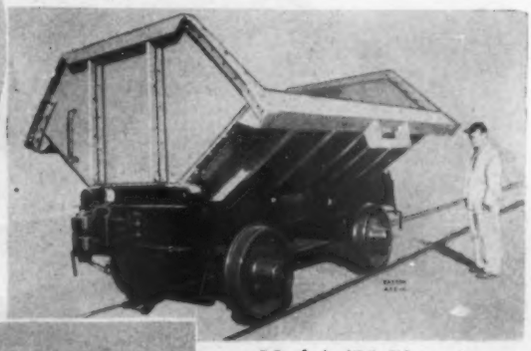
EASTON's experience since 1914 in the mining and quarrying industries is your assurance of good counsel. Write to Engineering Counsel, Easton Car & Construction Company, Easton, Pa.



Model TR-15T trailerized mine car, eight oscillating wheels, side dumping

Model TG-710 trailerized mine car, automatic down fold door

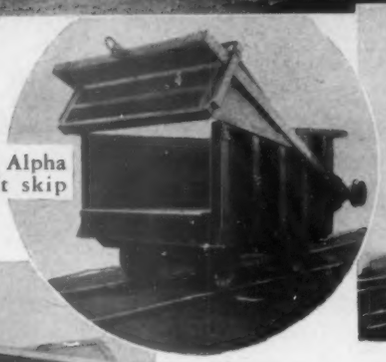
Model BB-1830 truck body, overhead hoist



Model 472 Phoenix car, either side dump

Model TR-15D trailerized mine car, two Phoenix bodies

Model 12772 Granby car, dumps in transit



Model 16030 Alpha car, bale lift skip

Model 19608 Cornwall car, floor-mounted air hoist

Model TR-13H trailerized mine car, hydraulic dump

EASTON

INDUSTRIAL CARS
TRUCK BODIES • TRAILERS
ELECTRIC LIFT TRUCKS

B-1017

PIT AND QUARRY, July, 1945, Vol. 38, No. 1. Published monthly by the Complete Service Publishing Company, 528 South Clark Street, Chicago 5, Ill. Subscription price $2 for 1 year in the U. S. and possessions, Canada, Central and South America; elsewhere $1 additional for each year. Single copies 50 cents. Entered as second-class matter February 28, 1932, at the Post Office at Chicago, Ill., under the Act of March 3, 1897.

16 tons...40 mph...2000 tons per day!

WHEREVER YOU find a job of tough, heavy hauling going along fast and easy, you'll usually find a Mack. The reason? Simple. Mack trucks are built to be the *best* in the world. Performances *prove* the success of that aim!

The Harmon Creek Coal Corporation operates a fleet of seven Macks in the Pittsburgh coal area. These trucks average 2,000 tons a day on a 7-hour day basis. Where mine road conditions permit, these rugged Macks haul their 16-ton payloads at 40 miles an hour! An amazing performance, yes, but day after day routine for Mack. Because you've got *more* truck, you get *more* work from a Mack!

★ BUY THAT EXTRA WAR BOND TODAY ★

Mack Trucks, Inc., Empire State Building, New York, N. Y. Factories at Allentown, Pa.; Plainfield, N. J.; New Brunswick, N. J.; Factory branches and dealers in all principal cities for service and parts.

Mack
TRUCKS
FOR EVERY PURPOSE
ONE TON TO FORTY-FIVE TONS

NEW Mack Trucks are available for essential civilian use. Ask for details.

An "Inside" Tip on better V-Belt performance

HERE you see the "inside" reason why Goodyear's time-proved E-C Cord Multi-V Belt is the standout cotton cord belt for high-efficiency performance and long life. Note the large diameter of the tough, endless, heavy-duty cord that sinews this great belt. Comparatively speaking, it is truly ropecord—high in tensile strength and stretch resistance.

This Goodyear-pioneered construction makes it possible to concentrate the load-carrying cord in the neutral section—where it is not subject to either extreme tension or compression in bending around the pulleys. Thus the entire strength of the cord is employed in pulling the load—not sapped by internal friction, buckling or distortion. Every cord does its full share of work.

Add to this the precision-matching that insures uniform length in every set and it is easy to see why Goodyear E-C Cord belts are the best-balanced belts you can buy for multi-V drives. Every cord in every belt pulls its full share of the load, insuring longer life and maximum power output. Order from your V-belt jobber, or write Goodyear, Akron 16, Ohio, or Los Angeles 54, California.

ON "KILLER" DRIVES specify the new Goodyear Steel-Cable V-Belt

This revolutionary Goodyear development handles drives never successfully powered by V-belts before. Operates at belt speeds ranging from 38 to 9,400 F.P.M. — with negligible stretch, creep or slip. Strength to spare for heaviest shock loads. The ultimate V-belt — nearly THREE MILLION now in use.

E-C Cord—T.M. The Goodyear Tire & Rubber Company

FOR HOSE, BELTING, MOLDED GOODS, PACKING built to the world's highest-quality standard, phone your nearest GOODYEAR INDUSTRIAL RUBBER PRODUCTS DISTRIBUTOR.

THE GREATEST NAME IN RUBBER

GOODYEAR

24 REASONS for making the next one a LORAIN!

NOTE: All Lorain machines are fully and easily convertible for use as cranes, clamshells, draglines, shovels and backdiggers. Don't buy a single-purpose machine; keep future jobs in mind. One machine—one investment—can do a wide variety of jobs for extra profits!

1. Center Drive turntable.
2. Permits concentrating power on any one operation.
3. Permits spreading power for high-speed simultaneous operations.
4. Two-piece swing drums, roller bearing mounted, reversible bands.
5. Extra wide crowd clutch, roller bearing mounted.
6. Hydraulic coupling—no stall, no shock, no loafing; (used on L 82 and L 820).
7. Center "Chain" Drive crawler.
8. Two travel speeds either direction.
9. Steers either direction.
10. Safety travel and tread lock.
11. Mechanism runs in oil bath.
12. Generous underneath clearances.
13. Centralized lubrication.
14. Wider treads.
15. All-welded shovel boom (strength; all-steel; torsion-resisting).
16. All-steel welded dipper stick.
17. Dipper door stops to protect stick.
18. "Elbow action" power dipper trip.
19. Simultaneous hoist, swing and travel (or boom derricking).
20. High-speed boom hoist—power controlled boom derricking and lowering.
21. "Cable-Miser" fairlead with interlocking, geared sheaves.
22. Bolted butt crane boom connections, easy and quick to assemble.
23. All-purpose Crane Boom Head—6 part reeving with no top block; greater vertical reaches.
24. Backdigger Boom—with controlled tilting dipper; digs a vertical wall, a level floor, dumps exactly where wanted.

Reg. Trade Mark

thew-Lorain

THE THEW SHOVEL COMPANY
LORAIN, OHIO

CRANES • SHOVELS • DRAGLINES • MOTO-CRANES

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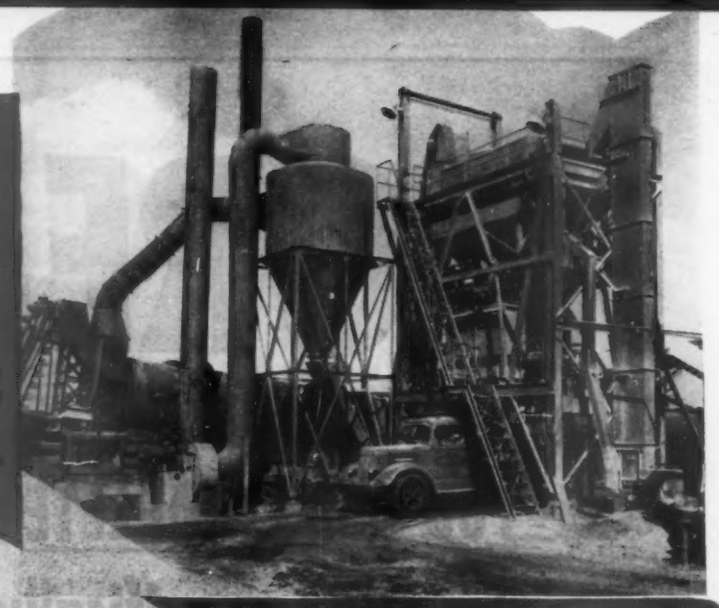
BUILD BETTER

Airports

Use a CEDARAPIDS

Model "E" ASPHALT PLANT



Courtesy of TWA

Cedarapids

Built by IOWA

THE IOWA LINE

of Material Handling Equipment Inc.

ROCK AND GRAVEL CRUSHERS
BELT CONVEYORS
STEEL BINS
BUCKET ELEVATORS
VIBRATOR AND REVOLVING SCREENS
STRAIGHT LINE ROCK AND GRAVEL PLANTS
FEEDERS—TRAPS
PORTABLE POWER CONVEYORS
PORTABLE STONE PLANTS
PORTABLE GRAVEL PLANTS
REDUCTION CRUSHERS
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DRAG SCRAPER TANKS
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TRACTOR-CRUSHER PLANTS
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IOWA MANUFACTURING COMPANY

Cedar Rapids, Iowa

IN BINDING

MORE THAN 'G

You get COMPLETE LUBRICATION SERVICE —designed specifically for Contractors—when you call SOCONY-VACUUM! This new time-savi service includes field-proved maintenance schedules—regular on-the-job deliveries and other custom-planned benefits.

SOCONY-VACUUM OIL COMPANY, INC., and Affiliates:
Magnolia Petroleum Co., General Petroleum Corp. of Calif.

"GAS AND OIL"

EVERY DETAIL of this new service has been planned to help you come out *ahead* in your constant race against time! Out on the job—in your maintenance department—all through your operation, it eases pressure—saves time.

Now, more than ever before, a single breakdown can paralyze a whole team of machines. That's why it is so vitally important to give every part maximum protection. With our *complete* line of quality lubricants, you're sure of getting exactly the *right* oil or grease for every application! No danger of having to make the wrong lubricant "do"—no waiting around for special orders—no necessity for follow-ups.

To help keep interruptions and inventory problems at a minimum, your Socony-Vacuum Representative arranges automatic on-the-job deliveries. He'll also supply you with job-tested maintenance schedules—help your men adapt them to your specific needs and put them into operation.

Additional Socony-Vacuum "plus" services include engineering aid when needed and free training on the Correct Lubrication for every machine you use.

Instead of getting fuels and lubricants, alone, call in Socony-Vacuum and get Complete Lubrication Service for Contractors!

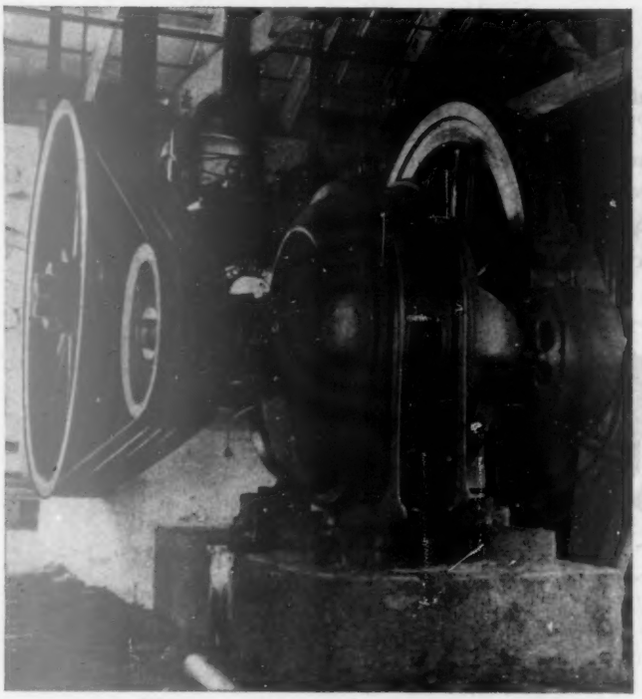
"ON YOUR STAFF—BUT NOT ON YOUR PAYROLL"—
Your Socony-Vacuum Representative

CORRECT LUBRICATION FOR EVERY PART OF EVERY MACHINE YOU OPERATE . . .
PLUS
1 ENGINEERING HELP on time-losing operating problems; 2 TESTED MAINTENANCE SCHEDULES that minimize service man-hours—keep equipment on the job;
3 PROMPT, DEPENDABLE DELIVERY—a reliable, on-the-job service that eliminates inventory problems for you!

"INFORMATION PLEASE" returns from vacation September 10. Until then, hear Rise Stevens and Hollywood Music—Mondays 9:30 P. M., E. W. T., NBC

SILENT
DEPENDABLE
ECONOMICAL . . .

Wood's V-BELT DRIVES



LONG LIFE LINE

for STONE CRUSHING

Precision design and construction characterize this ideal power transmission unit. Soundly engineered, fabricated from superior materials, the silent, dependable Wood's V-Belt drive is an economical investment because—

1. Wood's precision V-groove sheaves have perfectly designed grooves, accurately machined to gauges for width, depth and angle. They are uniformly spaced and conform to standards set in the industry. Wood's are the oldest builders of cast iron pulleys. The proportions of rim, hubs and arms developed through years of experience in the design and manufacture of pulleys, have helped Wood's to produce the best type of V-groove sheave.

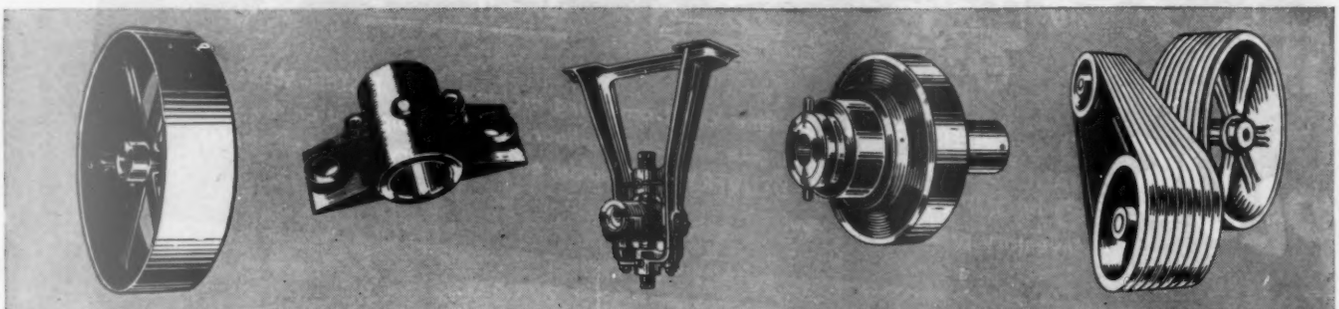
2. Wood's V-Belts are full molded, resilient and flexible . . . extremely accurate in design. The fact that horsepower requirements utilize only a small percentage of the ultimate strength of these belts—ruggedly constructed of the strongest materials—accounts for their extremely long life.

3. Wood's V-Belts and sheaves are *engineered to work together.* Since the proper groove contour of the sheave permits complete belt contact and uniform seating of the "tailor made" V-Belts, Wood's V-Belt drives transmit energy from its source to the driven machinery with maximum efficiency.

Engineering consultation welcomed . . . or see your conveniently located Woods dealer.

EVERYTHING IN TRANSMISSION

Bearings—Collars—Clutches—Couplings—Contactors—Hangers—Pillow Blocks—Pulleys—V-Belt Sheaves and Complete Drives



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Traylor has over twenty-five years of experience in manufacturing cement making machinery. In that time we have helped equip scores of cement plants in this and many foreign countries.

This experience plus an intimate knowledge of the needs of cement manufacturers keeps Traylor cement mill equipment always up to date. Many improvements are constantly being incorporated in all Traylor machines.

Traylor has many facilities created especially to serve the cement industry, which are at your command for future improvements or expansion.

Write us if our engineers can help solve your problem.

TRAYLOR ENGINEERING & MANUFACTURING CO.

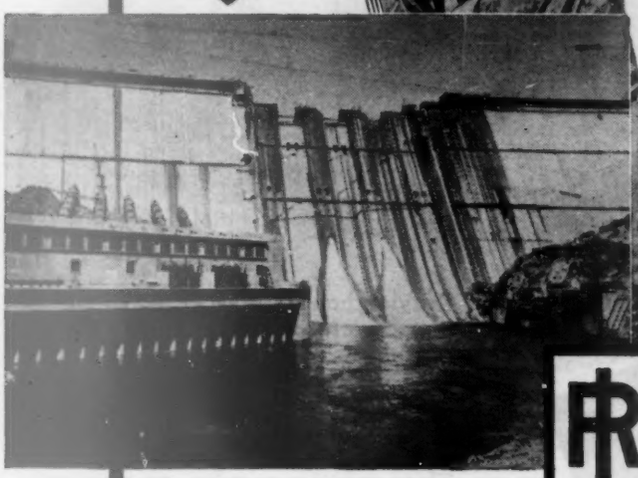
ALLENTOWN, PENNSYLVANIA, U.S.A.

In 1939 we said

INGERSOLL-RAND

42 WAGON DRILLS at Shasta Dam

In July 1944 Shasta Dam began the production of 150,000 kw. of electricity.



THE LARGEST NUMBER OF WAGON DRILLS EVER USED ON ANY ONE JOB . . . . . .

All FM-2s With X-71 Drifters

Shasta Dam is the biggest rock job in the country today . . . about 2,000,000 cubic yards.

The drilling on this project is a major problem, because of the hard rock and uneven ground. 20-foot holes are required to get the necessary yardage.

Because of their past experience with many types of wagon drills, the contractors chose the Ingersoll-Rand FM-2 to do this job. They knew that it had the flexibility needed for drilling in the rough ground; the power and hole cleaning ability required to drill 20-foot holes in hard rock, and the sturdy construction necessary for low upkeep costs.

If you have a tough job of drilling to do, use FM-2 Wagon Drills. They will also cut your costs.

Ingersoll-Rand

11 BROADWAY, NEW YORK N.Y.

FM-2 Wagon Drills..

Important Factors in Successful Completion of Shasta Dam.

FM-2 Flexibility and Deep-Hole Drilling Power will Save You Time and Money Too.

Ingersoll-Rand

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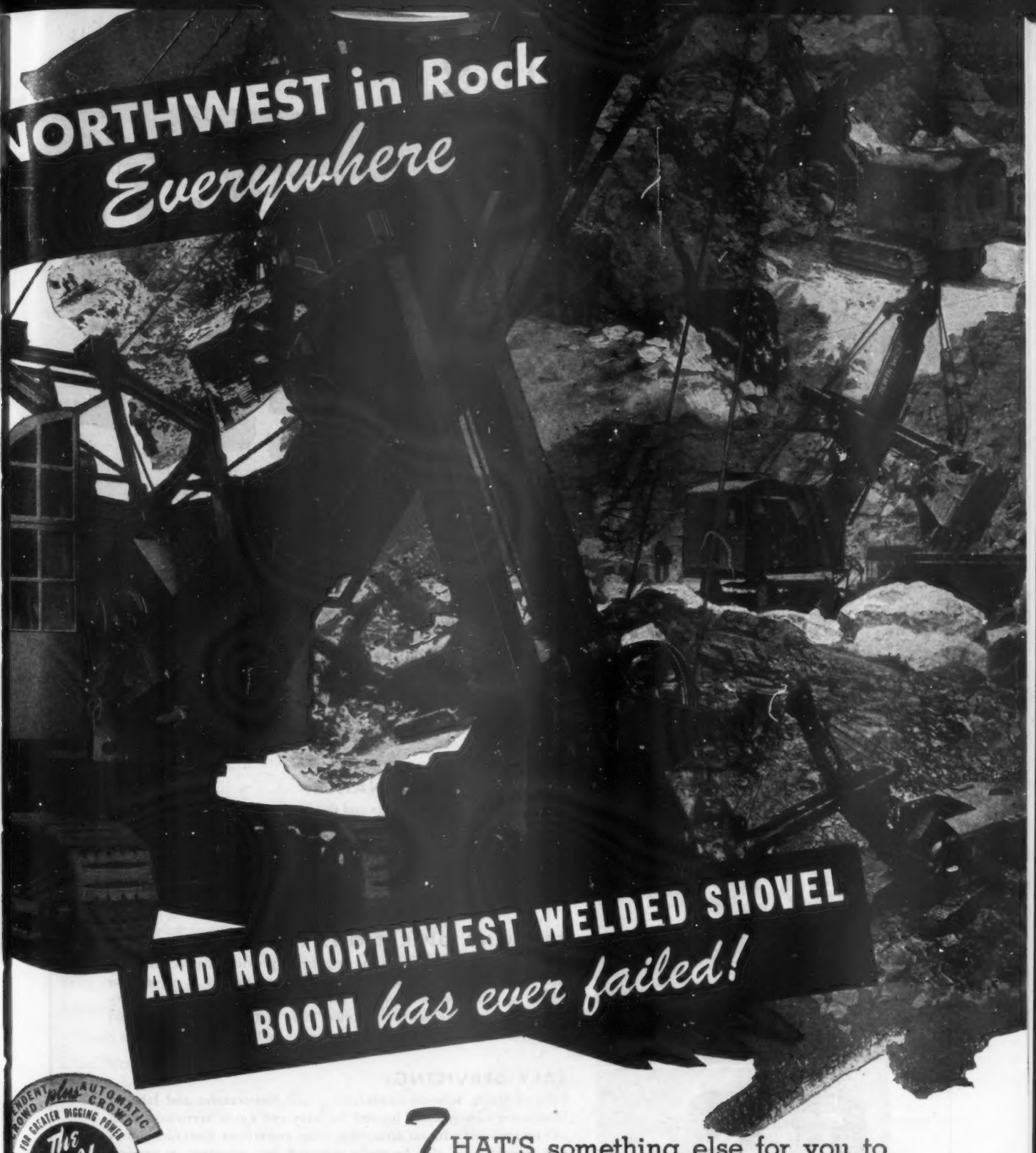

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FOR GREATER DIGGING POWER
The DUAL CROWD

and when
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Rock Shovel
you won't have
to worry about
output in dirt

THAT'S something else for you to think about in your post war planning! Better built—cheaper to operate—a Real Rock Shovel and if you have a Real Rock Shovel you'll have high output in any kind of digging.

NORTHWEST ENGINEERING COMPANY
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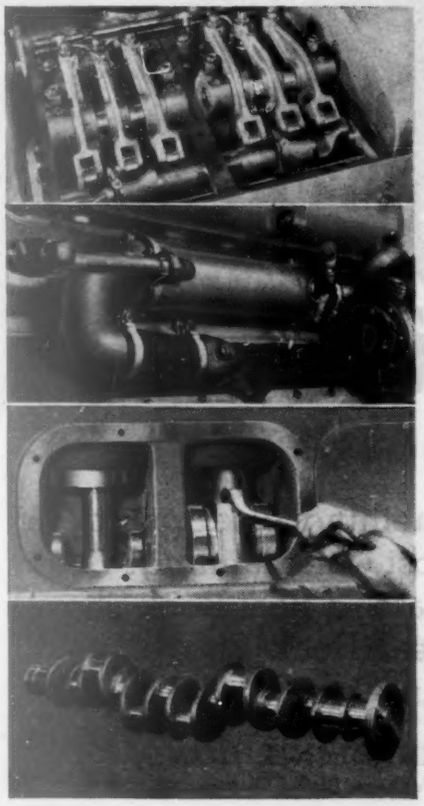
NORTHWEST

BINDING

Announcing:

THE NEW SERIES 20 HENDY DIESEL

NOW in the 190 to 250 horsepower range—Hendy Series 20 Diesels bring new standards of dependability and economy to the industrial field. They are designed from the owner's viewpoint entirely—no concessions were made in design, use of old patterns, practices, or tooling. Consequently, Series 20 Diesels have features never before available in engines of this size. The industrial users of Diesel power can *now* obtain the very latest in tested Diesel-engine performance.



REDUCED MAINTENANCE:

Unit fuel pumps and injectors and the overhead camshaft eliminate all high-pressure fuel lines and many moving parts. Air-starting valves, intake and exhaust valves, and fuel injectors and pumps are actuated by rocker arms bearing directly on the overhead camshaft. Inspection and adjustments of valves and injection system can be made by removal of cylinder-head covers.

EFFICIENT OPERATION:

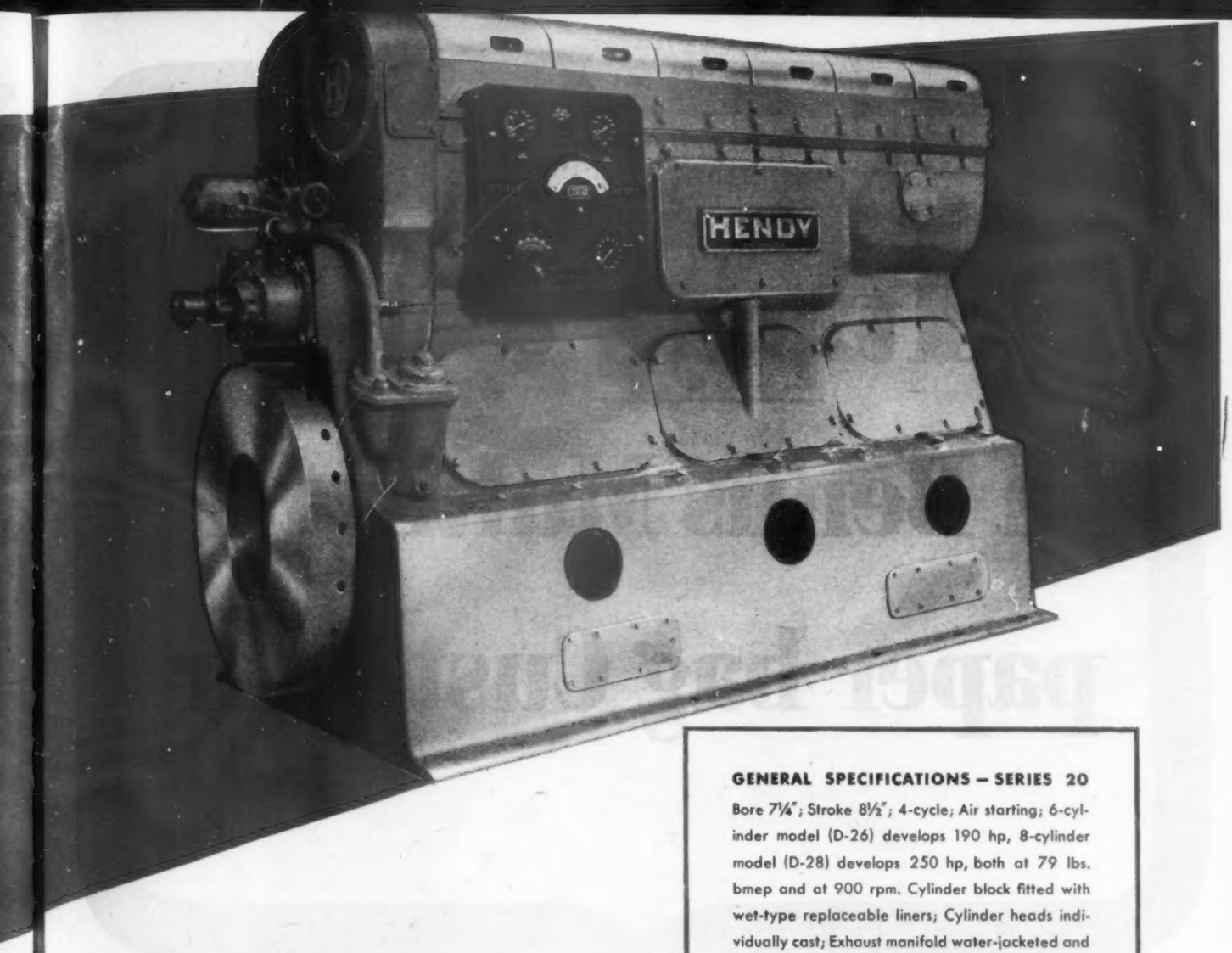
Full pressure lubrication to moving parts provides correct lubrication at all times. An integral oil-cooler keeps the oil at an efficient operating temperature. Uniform cylinder and head temperatures are assured by high velocity, controlled flow of the cooling water and the advanced design of the water jackets.

EASY SERVICING:

Fuel-oil filters, lube-oil conditioners, and fuel-transfer and lube-oil pumps are conveniently located for easy and quick servicing. Each can be removed without disturbing other assemblies. Unit fuel pumps and injectors can also be easily removed for inspection or service. Main and crankpin bearings are readily accessible by quickly removing the large hand-hole plates...without disturbing any other assembly.

LONGER LIFE:

The crankshaft is dynamically balanced, to minimize vibration at *all* speeds, and is large and well proportioned to assure long life and smooth operation. All bearing surfaces receive positive pressure lubrication. The crankshaft is supported by large, replaceable, bronze-backed bearings.



GENERAL SPECIFICATIONS — SERIES 20

Bore 7¼"; Stroke 8½"; 4-cycle; Air starting; 6-cylinder model (D-26) develops 190 hp, 8-cylinder model (D-28) develops 250 hp, both at 79 lbs. bmep and at 900 rpm. Cylinder block fitted with wet-type replaceable liners; Cylinder heads individually cast; Exhaust manifold water-jacketed and cast in sections; Pistons, cast iron; Full pressure lubrication to moving parts, with oil cooled and filtered before entering distribution manifold. Optional equipment includes: closed-circuit cooling systems; clutch power take-offs from either end; belt-driven starting-air compressor. Also available as complete electric generating plants.

Diesel-power users will appreciate many important features in addition to those listed at the left. These new engines were designed specifically to meet the most rigid tests for economy and maximum dependability. And, what is equally important, they are built by skilled mechanics in plants unusually well equipped with modern, precision machine tools that take full advantage of production-line methods. Other Hendy Diesels available up to 800 horsepower. Joshua Hendy Iron Works, Sunnyvale, California.

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JOSHUA **HENDY** IRON WORKS
ESTABLISHED 1856
SUNNYVALE, CALIFORNIA

Please send me complete details on Hendy Series 20 Stationary Diesel engines ☐. Hendy Series 20 Diesel-generator sets ☐.

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94-D-18

It pays to be a Bemis Multiwall paper bag Customer

EVEN though direct government purchases have taken a considerable part of our multiwall paper bag production this year, Bemis customers have not suffered . . . they have been supplied on the basis of past purchases, even in the face of the labor shortage and no increase in facilities.

Naturally, the demand for Multiwalls has been greater than the supply. Much as we regret inability to fill all orders, we have felt a responsibility to take care of our regular customers first. Fortunately, we've been able to do that—and right on schedule. If it's humanly possible, we'll keep on maintaining this service.

War or peace, we want our customers to feel that it pays to be Bemis customers.

NORTH
WEST EAST
SOUTH

A major reason we've been able to supply our Multiwall customers is the size and flexibility of our production facilities.

Bemis Multiwall Plants at

PEORIA, ILL.
EAST PEPPERELL, MASS.
MOBILE, ALA.
SAN FRANCISCO, CALIF.
WILMINGTON, CALIF.
ST. HELENS, ORE.

These plants not only give us large production, but also quick accessibility to all parts of the country.

BEMIS BRO. BAG CO. Baltimore • Boston • Brooklyn Buffalo • Charlotte • Chicago
Denver • Detroit • Houston • Indianapolis • Kansas City • Los Angeles • Louisville
Memphis • Minneapolis • New Orleans • New York City • Norfolk • Oklahoma City • Omaha
St. Louis • Salina • Salt Lake City • Seattle • Wichita

...safe by ~~inches~~ OUNCES

Practice makes perfect! To master the split-second technique of successful base-stealing, many a baseball player *practices* with a few ounces of LEAD in his shoes—deliberately handicapping himself during the training season so he will have a "plus" in speed for the pinches.

It is that same PRICELESS "PLUS" that pays off in a product . . . a process . . . a "know how." It is that PRICELESS "PLUS" that has made Hewitt industrial rubber products outstanding for 85 years . . . that led to Hewitt's pioneering leadership in the synthetic rubber field 14 years ago . . . that makes buyers realize that when it comes to JOB-ENGINEERED Industrial Rubber Products, "Hewitt Can Do It!"

★ ★ ★

Specify "Hewitt" for quality industrial rubber products. Phone the Hewitt distributor listed in the Classified Section of your telephone directory . . . or write Hewitt Rubber Corporation, 240 Kensington Avenue, Buffalo 5, New York.

HEWITT RUBBER *of Buffalo*

Job-Engineered Industrial Hose • Belts • Molded Goods

QUALITY RUBBER PRODUCTS FOR INDUSTRY FOR 85 YEARS

"...now use Ring-Free exclusively..."

Excerpts from letter of—
N. G. HILL
N. G. Hill & Co., Contractors
Phoenix, Arizona

"...four years ago, after we purchased a fleet of Chevrolet trucks for a road construction job on Highway 77, we were induced to try Ring-Free Motor Oil.

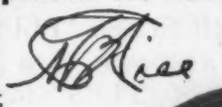
...the test was a tough one due to weather conditions...heavy snow and rain in winter...heat and dust storms in summer.

...during all this time we did not pull a head or pan in any of the trucks except one damaged by striking a huge boulder.

...after the job was completed we removed heads and pans on all motors which had from 50,000 to 60,000 motor miles.

...all compression rings were free...all drain holes in oil rings open...also drain back holes in pistons completely open and no carbon on the under side of the pistons. Cylinder heads and valves were also clean and all valve stems free in the guides. Engine pans and oil pump screens were cleaner than we expected...all bearings were in good shape.

...we now use Ring-Free exclusively in all our equipment*...we recommend Ring-Free Motor Oil to other contractors."



* *36 Trucks—Fords, Chevrolets, Internationals; 6 A.C. Tractors, Diesel powered. 1 D-8 Caterpillar; 3 Graders—2 powered by International and 1 by Caterpillar motor; 1 International T. D-40 Tractor; 1 Lorraine 40—¾ cubic yard power shovel; 3 Light Plants powered by Kohler motors; 1 Gravel plant powered by 8800 Caterpillar Diesel. Also numerous pick-ups and station wagons.*

Operators of all types of equipment report lower-cost, more efficient performance with Ring-Free Motor Oil. Find out how Ring-Free can help lick your toughest lubrication problems... Phone or write the nearest Macmillan office.

MACMILLAN PETROLEUM CORPORATION

MACMILLAN RING-FREE MOTOR OIL

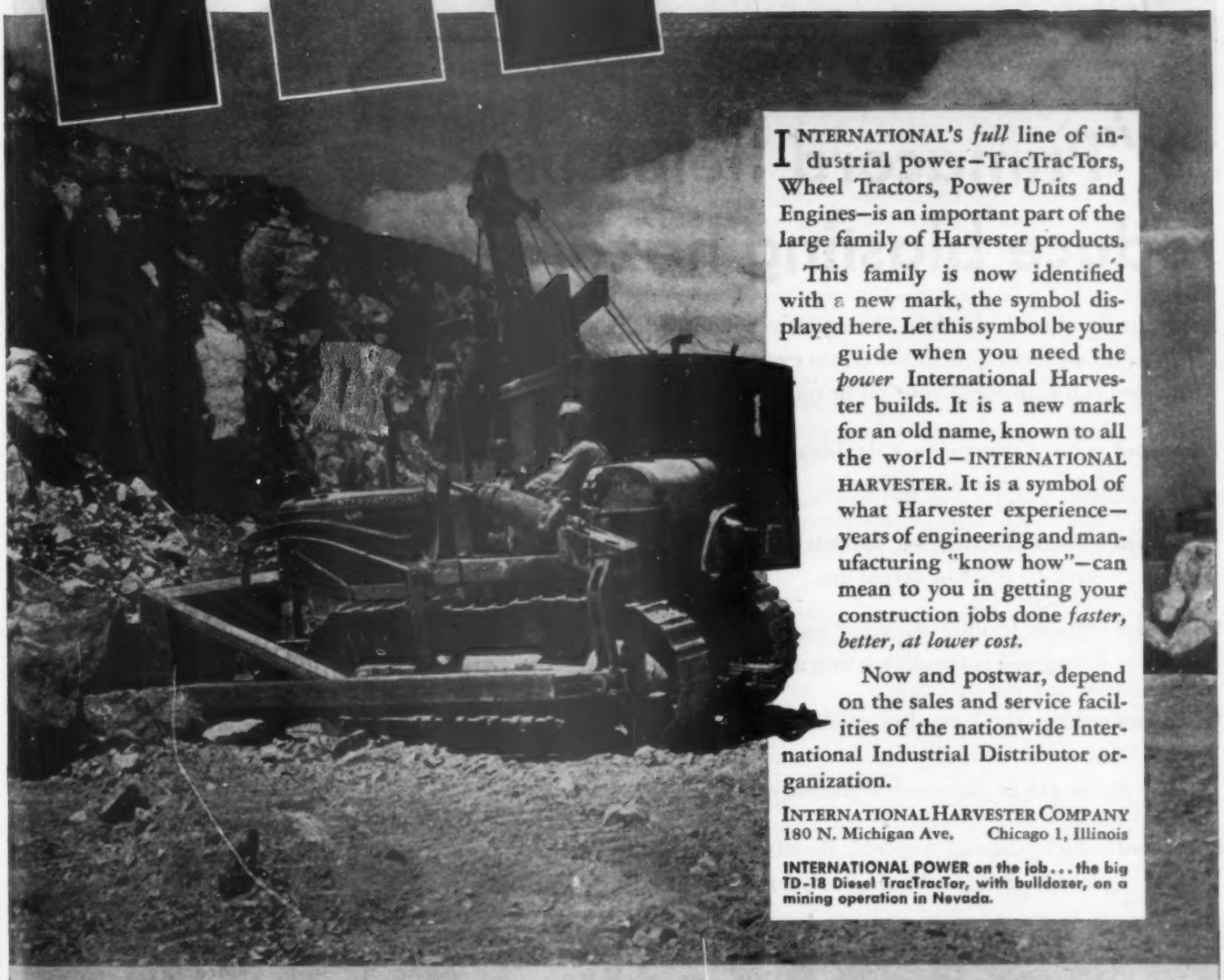
50 W. 50th Street, New York 20 • 624 So. Michigan Avenue, Chicago 5 • 530 W. Sixth Street, Los Angeles 14 • **Copyright 1945, Macmillan Petroleum Corporation**

This Symbol means:

"Product of INTERNATIONAL HARVESTER"

★

It is the Mark of EXPERIENCE and SERVICE



INTERNATIONAL'S *full* line of industrial power—TracTracTors, Wheel Tractors, Power Units and Engines—is an important part of the large family of Harvester products.

This family is now identified with a new mark, the symbol displayed here. Let this symbol be your guide when you need the *power* International Harvester builds. It is a new mark for an old name, known to all the world—INTERNATIONAL HARVESTER. It is a symbol of what Harvester experience—years of engineering and manufacturing "know how"—can mean to you in getting your construction jobs done *faster, better, at lower cost.*

Now and postwar, depend on the sales and service facilities of the nationwide International Industrial Distributor organization.

INTERNATIONAL HARVESTER COMPANY
180 N. Michigan Ave. Chicago 1, Illinois

INTERNATIONAL POWER on the job... the big TD-18 Diesel TracTracTor, with bulldozer, on a mining operation in Nevada.

Power for Victory... Power for Peace

INTERNATIONAL HARVESTER

"Primacord helps us reduce blasting hazards"

From the standpoint of safety, the explosives industry as a whole is one of the best, because safety is instilled into every worker's thinking. However, Primacord can help make your pit or quarry even safer.

Primacord reduces storage hazards, because it is not detonated by sparks, friction or ordinary shocks.

Primacord reduces distribution hazards, because it is safe to handle and carry to point of actual use.

Primacord reduces loading hazards, because no cap goes into the hole. Primacord is the detonating agent.

Primacord reduces the hazard of premature shots, because static or stray currents do not affect it — and the blasting cap is the last thing to be attached to the main trunk line.

Primacord reduces digging hazards, because it detonates every properly placed cartridge, leaving no unexploded powder in the rock pile.

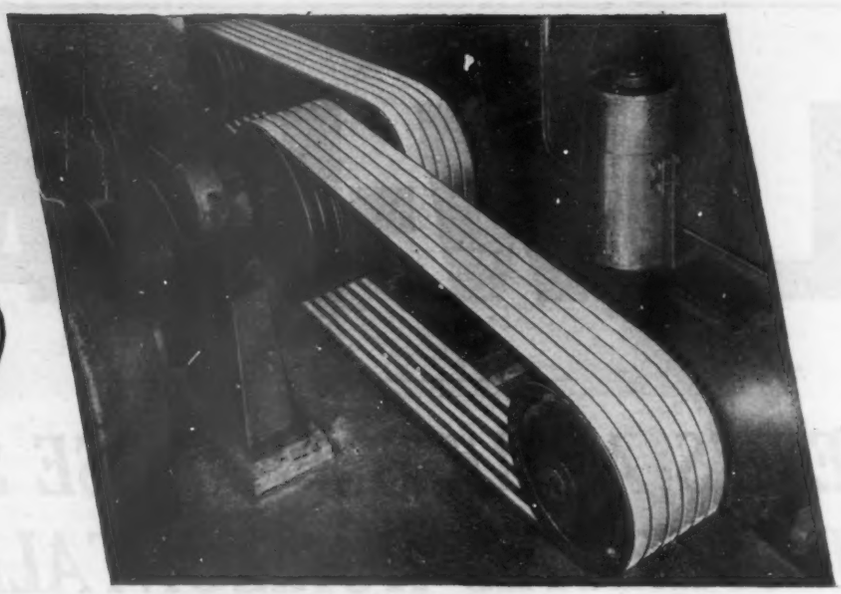
Five bull's-eyes in a row to prove that Primacord Detonating Fuse hits the mark for safety.

P-6

Also
ENSIGN-BICKFORD SAFETY FUSE
Since 1836

THE ENSIGN-BICKFORD COMPANY • Simsbury, Connecticut

PRIMACORD-BICKFORD Detonating • Fuse •



HERE IS A FACT WORTH KNOWING

GATES *Standard* VULCO ROPES

—now made of *Synthetic Rubber* are

OUTWEARING even *pre-war* belts of *NATURAL RUBBER!*

NO ONE before the war had ever built a V-Belt that could stand the service now daily delivered by Gates V-Belts on army tanks, tractors and self-propelled big guns. Gates developed these greatly superior V-Belts through intensified, specialized research—and Gates is building these belts entirely of synthetic rubber.

✔ **The importance of this fact to industrial V-Belt users is this:**

Every improvement developed by Gates for these Army V-Belts has also been added, day by day, to the quality of the standard Gates Vulco Ropes which have been delivered to you.

It is only rarely, of course, that improvements developed primarily for army combat use can be passed on immediately to the general user—but there are very good reasons why Gates has not been called upon to withhold these important V-Belt improvements from Industrial V-Belt users.

Efficient production in our nation's industrial plants is a prime essential to our winning of the war—and better V-Belts than ever before have been urgently needed to keep machines going on the forced-draft, war production schedules that have had to be maintained *24 hours a day!*

That is why Gates has been able to embody in the standard Gates Vulco Rope every V-Belt improvement which Gates specialized research has developed for use on the Army's motorized equipment—and that is why you are finding that your standard Gates synthetic-rubber Vulco Ropes are today giving you better service than any V-Belts that were built before the war.

Gates

THE MARK OF SPECIALIZED RESEARCH

THE GATES RUBBER COMPANY

Engineering Offices and Jobber Stocks in All Large Industrial Centers

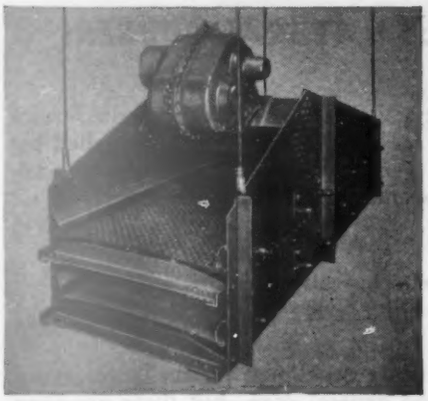
457

GATES VULCO ROPE DRIVES

CHICAGO 6, ILL. 549 West Washington. NEW YORK CITY 3, 215-219 Fourth Avenue ATLANTA 3, GA., 738 C. & S. National Bank Bldg.
LOS ANGELES 21, CAL., 2240 E. Washington Blvd. DENVER 17, COLO., 999 S. Broadway DETROIT 4, MICH., 8663 Grand River Ave.
PORTLAND 9, ORE., 333 N.W. 5th Ave. DALLAS 2, TEXAS, 1710 N. Market St. SAN FRANCISCO 3, CAL. 1090 Bryant St.

"LOW-HEAD"

HERE'S A MULTI-PURPOSE SCREEN THAT OPERATES HORIZONTALLY--SAVES SPACE, CUTS INSTALLATION COSTS!

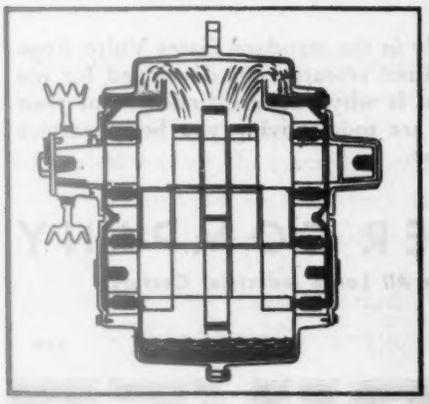


1 Want to remodel, but find that *inclined* screens require building changes? "Low-Head" Vibrating screens may be your answer. Reason: They operate *horizontally*—save headroom and space!

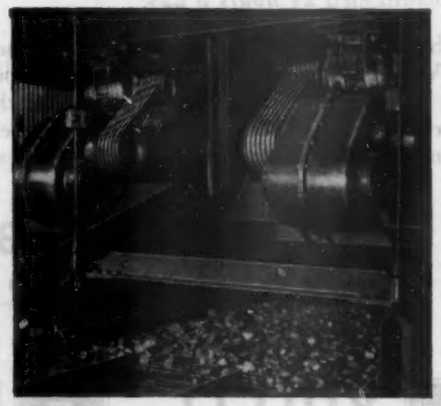
STRESS-RELIEVED
All stresses and strains removed after welding and before machining.
NOT STRESS-RELIEVED
Locked-up stresses tend to distort frame —cause early failure.

2 A-C guards against failure in the field by *"stress-relieving"* side plates and frames. That means *uniformly* strong bodies — the ability to *resist* damaging vibration year after year!

3 One user reports he's getting *up to double* cloth life! Good reason is A-C research in development of support frames with adequate strength and correct crown for different grades of surfaces.

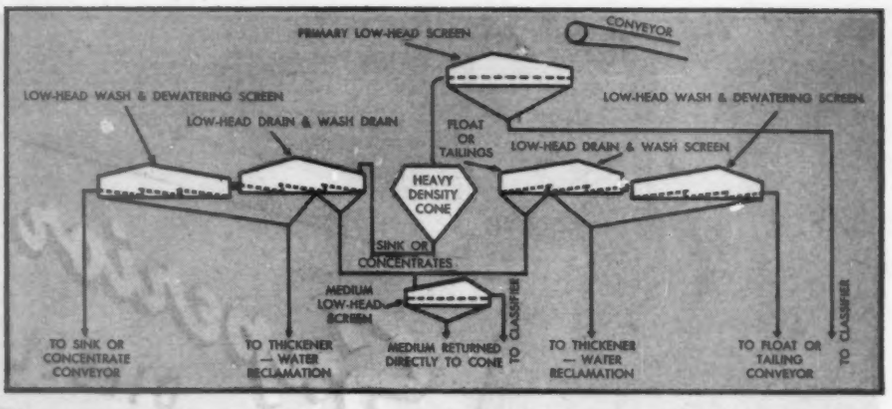


4 Operators like this compact mechanism—it's *easy* to inspect. And they don't worry about dust or oil. Mechanism is *totally enclosed*—gears and bearings are *continuously* splash-lubricated!



5 Two of many "Low-Head" screens speeding-up vital U.S. coal output. You'll find others at work on a wide range of products . . . from gravel and metallic ores to wood chips and foundry sand!

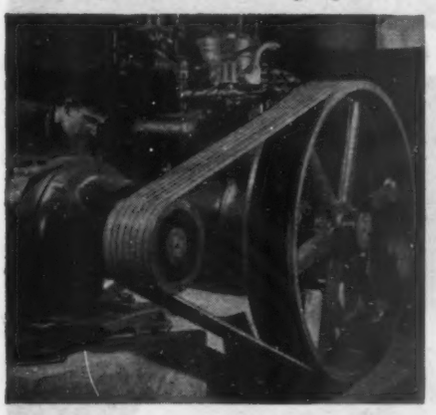
6 "Low-Head" screens are *versatile* —not only save you headroom, but can be used for wet or dry screening, dewatering, rinsing! For details on these modern screens, send for bulletin B6330.



7 Here's A-C developed 'End-Tension" deck for Sink and Float processes. It's *one* example of how A-C coöperates with Sink and Float companies—offers its experience to their progress.

8 Schematic sink-float flow sheet showing "Low-Head" screens with "End-Tension" decks. Pool washing features of the new decks effect important economies in total water consumption.

9 Horizontal operation plus new "End-Tension" decks also assures maximum recovery of medium; efficient washing of medium adhering to ores; thorough dewatering of concentrates, tailings.



10 A-C is the *only* company that builds basic processing equipment *plus* motors, controls, Texrope drives. That means *unit-responsibility*—no "buck-passing"!

11 Planning ahead for more efficient power distribution in your plant? This scale model "Unit Substation Builder Set" can help you plan *visually*—saves time!

12 New type "CW" Pump lowers cost-per-ton of *solids* handled over similar units—is representative of performance on other A-C pumps rated from 10 to 150,000 gpm.

♪ *Tune in the Boston "Pops", Blue Network, Saturdays at 8:30 pm, EWT.*

YOU CAN DEPEND ON A-C RECOMMENDATIONS!

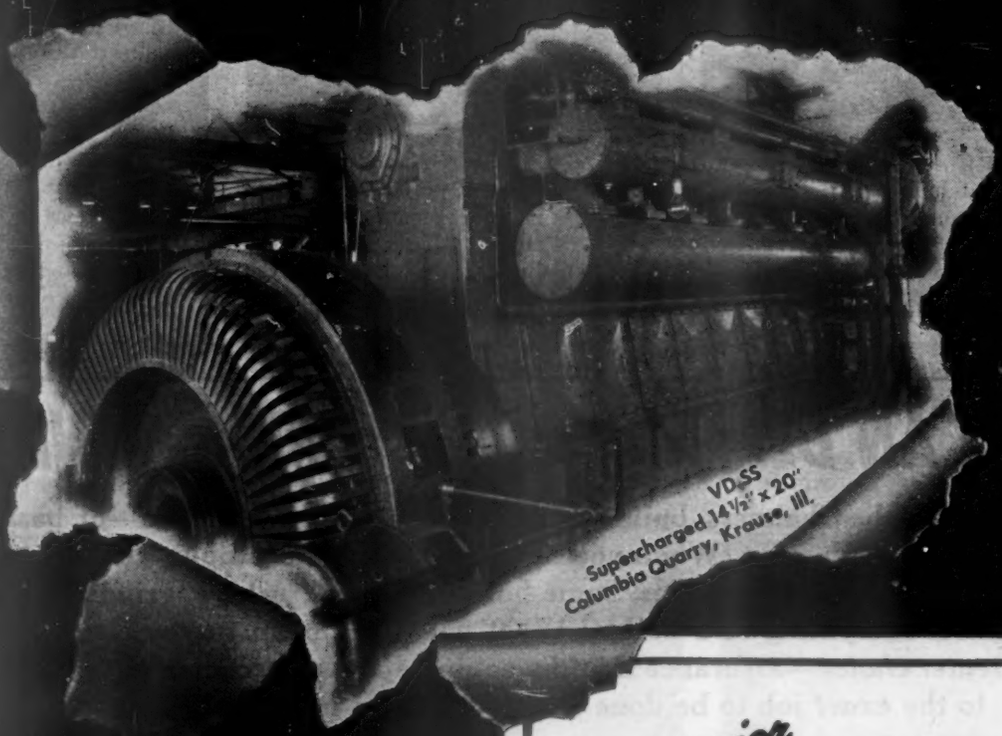
Allis-Chalmers builds *all* types—not just one or two—of basic processing equipment. When you need screens, for example, you can select from 4 types, 8 different styles. Same holds true for crushers, grinding mills . . . almost *everything* A-C builds! What does this mean to you? For one thing, *greater choice*—assurance that the equipment A-C recommends will be suited to the *exact* job to be done . . . isn't just an *improvised* way of doing it! 1881

ALLIS-CHALMERS

MILWAUKEE 1, WIS.

Superior DIESEL

a fine reputation for economical power . . . . . .



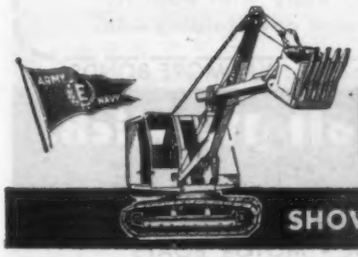
VD-SS
Supercharged 14½" x 20"
Columbia Quarry, Krause, Ill.

Superior ENGINES
Division of
THE NATIONAL SUPPLY CO.
Plant and General Sales Office:
Springfield, Ohio

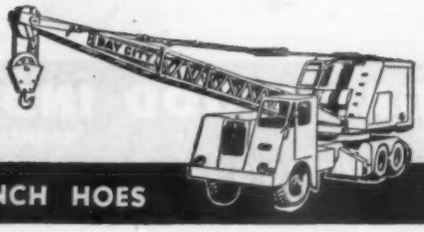
SUPERIOR DIESELS • STATIONARY, 28 to 1325 H. P.
MARINE, 28 to 1325 H. P. • GENERATOR SETS, 20 to 930 kw.

JUST OFF THE PRESS—
36-PAGE ILLUSTRATED BOOK
OF FACTS ABOUT BAY CITY SHOVELS!

For a graphic presentation of the reasons why BAY CITY shovels and cranes have earned their enviable record in excavating and material handling, get your free copy of the new 36-page BAY CITY catalog. It's crammed with cold facts, technical specifications and data, and on-the-job illustrations. It outlines and illustrates the design principles and engineering refinements which have put BAY CITY shovels and cranes among the leaders in fast, economical excavating and material handling equipment. It shows how the BAY CITY CraneMobile, the modern pneumatic-tire-mounted crane, will enable you to handle more jobs in a greater area—swiftly, economically, profitably. This big book is yours for the asking. No obligation, of course. Write for catalog M-4 • BAY CITY SHOVELS, INC., BAY CITY, MICHIGAN.



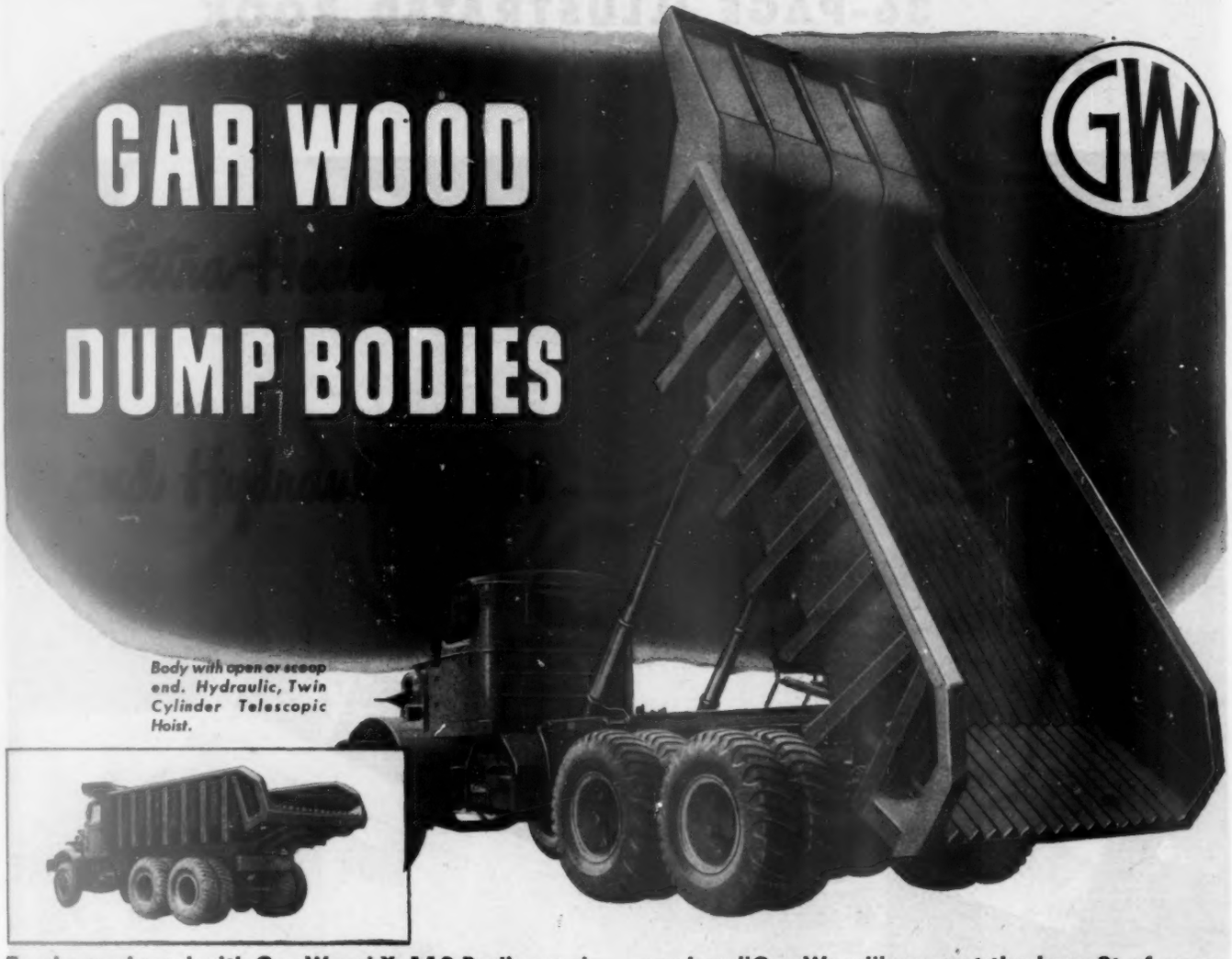
BAY CITY



SHOVELS • CRANES • DRAGLINES • TRENCH HOES

BIGGER LOADS . . . LOWER COST . . . GREATER PROFIT!

GAR WOOD DUMP BODIES



Body with open or scoop end. Hydraulic, Twin Cylinder Telescopic Hoist.

Trucks equipped with Gar Wood X-112 Bodies and T-4440 Hydraulic Hoists haul BIGGER LOADS on fast schedules. This speedier handling of overburden, ore and coal means lower operating cost and greater profit for you. Remember too, when you buy "Gar Wood" you get the benefit of more than a quarter of a century of experience in building Hydraulic Hoists and Dump Bodies . . . a factor that has made this line the most popular in the field and preferred by all types of operators.

Body with automatic downfold tailgate. Gate opens as body elevates.

One-way side dump Body with Dual Hydraulic Hoist. Automatic downfolding side.

Support the 7th War Loan . BUY MORE BONDS

GAR WOOD INDUSTRIES, INC., Detroit 11, Mich.

BRANCHES AND DISTRIBUTORS IN ALL PRINCIPAL CITIES

WORLD'S LARGEST MANUFACTURERS OF TRUCK AND TRAILER EQUIPMENT

WINCHES AND CRANES • TANKS • ROAD MACHINERY • HEATING EQUIPMENT • MOTOR BOATS

15% to 35% more air per gallon of fuel

CP PORTABLE COMPRESSORS

AN outstanding feature of CP Portable Compressors is the gradual speed regulator. Synchronizing engine speed with air demand, it varies the speed—not by steps but gradually – up and down, exactly as air demand varies. The result is a marked economy of fuel and a reduction in wear. CP's complete line of gasoline and Diesel powered compressors offers greater portability due to lighter, more compact construction. For full information write for Bulletin 758-2.

Chicago Pneumatic Portable Compressors are available in gasoline powered models of 60, 105, 160, 210 and 315 c.f.m.; and in Diesel powered sizes of 105, 160, 210, 315 and 500 c.f.m.; with steel wheels, pneumatic-tired wheels or skid mountings.

★★★★★★★★★
PNEUMATIC TOOLS
ELECTRIC TOOLS
HYDRAULIC TOOLS
ROCK DRILLS

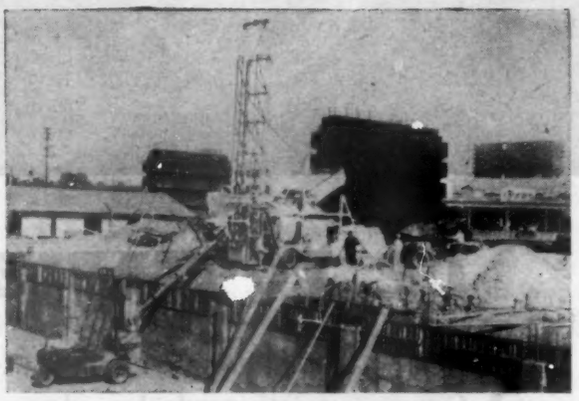
CHICAGO PNEUMATIC
TOOL COMPANY
General Offices: 8 East 44th Street, New York 17, N. Y.

★★★★★★★★★
AIR COMPRESSORS
VACUUM PUMPS
DIESEL ENGINES
AVIATION ACCESSORIES

SCOOPMOBILE SPEEDS WORK ON 2 WESTERN JOBS

SCOOPMOBILES are doing a wide variety of jobs the country over, in speeding wartime construction. Two, far removed from each, are illustrated below. Scoopmobiles are seldom idle. Attachments that can be changed in just a few minutes widen the variety of jobs one SCOOPMOBILE can accomplish. The scoopbucket lifts to any desired height up to 7½ feet, discharging a load of ¾ or 1 cubic yard at any point of its up and down travel.

AT EUGENE, OREGON, Scoopmobile works at the newly organized Silica Products, Oreg., Ltd. Illustrated is a Scoopmobile transferring sand from the stockpile to a hopper. Loads are carried swiftly and the large pneumatic tires haul loads with minimum shock.



AT ONTARIO, CALIFORNIA, a Standard Scoopmobile equipped with a ¾ cubic yard concrete hopper and an extended framework was added to allow a lift of 18 feet. 6,000 cubic yards of concrete were mixed and placed at a great saving to the contractors.

SCOOPMOBILE

KEEPS MATERIALS ON THE MOVE

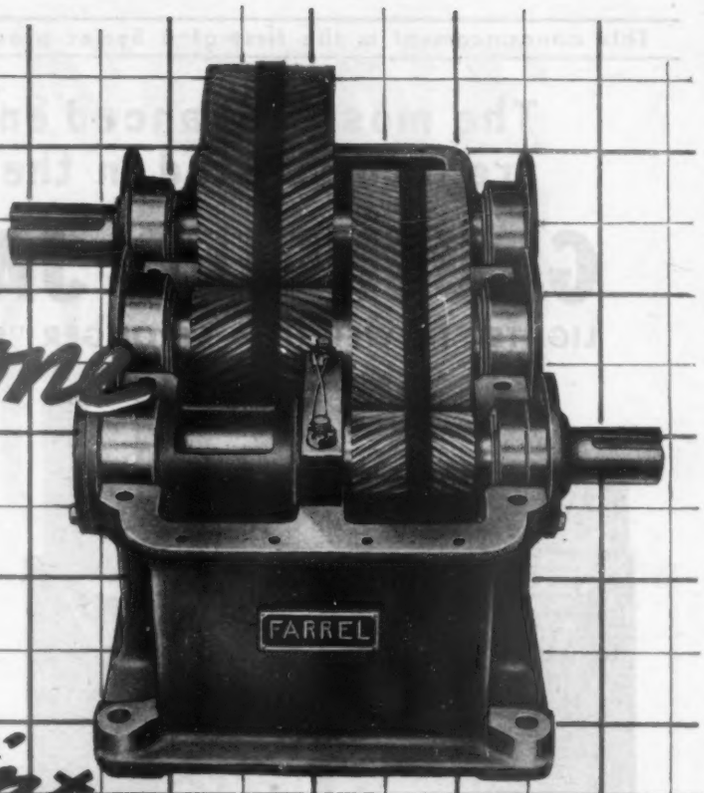
BUGGYMOBILE
MIXERMOBILE
SCOOPMOBILE

MIXERMOBILE

• MANUFACTURERS • •

6855 N. E. HALSEY STREET • • • PORTLAND 16, OREGON

This Backbone means lower maintenance cost per ton



The gears in Farrel Speed Reducers are the precision generated *Gear with a Backbone* type. The *backbone* (shown by the red area in the photograph) is formed by the juncture of the two helices to form continuous herringbone teeth, without a center groove.

The greater working face provided by the continuous teeth gives the gears extra strength and capacity to withstand the shocks, stresses and wear encountered in heavy duty service. Combined characteristics of overlap or interlacing of the teeth, gradual engagement and inclined line of pressure distribute the load uniformly over the entire face width, and contribute to smooth, quiet operation and maintenance of correct tooth action throughout a long gear life.

Other features which contribute to continuity of operation, with minimum maintenance, are:

1. Shafts ground to close tolerances and rigidly mounted in anti-friction roller bearings.
2. A lubricating system which provides ample oil supply to gears and bearings without danger of excess heat and wear.
3. Heavy, rigid housings which maintain accurate alignment of rotating elements.

Farrel Speed Reducers are available in a complete range of sizes, for any application. Ratios of single reduction units range from 1¼:1 to 10:1, double reduction units up to 60:1, and triple reduction units up to 180:1. For complete information write for Catalog No. 438.

FARREL-BIRMINGHAM COMPANY, INC.

344 VULCAN ST. • BUFFALO, N. Y.

Plants: Ansonia, Derby and Stonington, Conn., Buffalo, N. Y.
Sales Offices: Ansonia, Buffalo, New York, Pittsburgh, Akron, Los Angeles, Tulsa, Houston, Charlotte

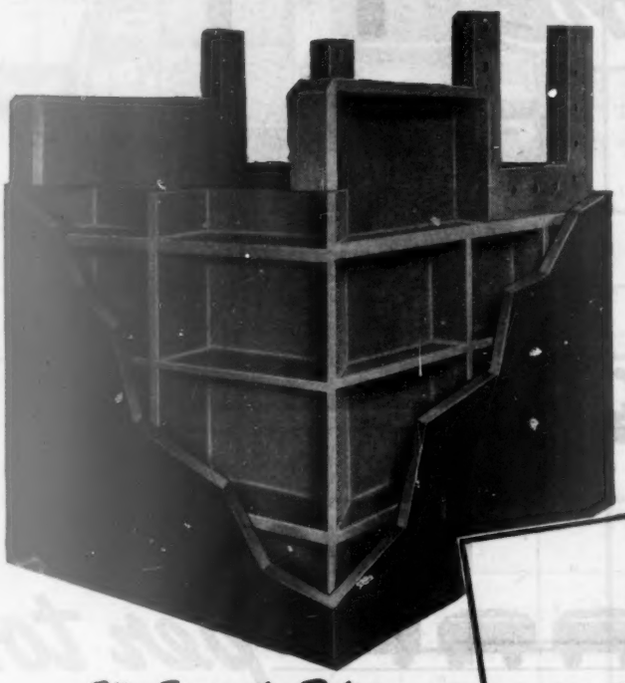
FARREL Farrel-Birmingham

This announcement is the first of a Series presenting new improved Gruendler Equipment.

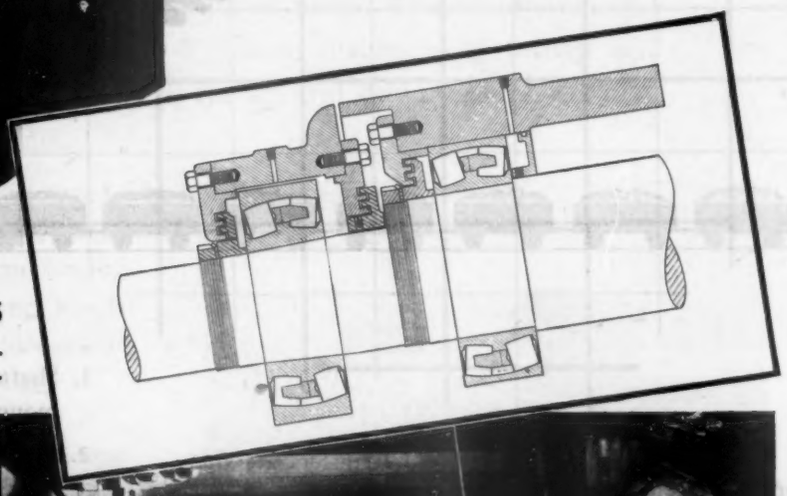
The most advanced engineering principles are incorporated in the new improved line of

GRUENDLER JAW CRUSHERS

LIGHTER IN WEIGHT • STRONGER "RIGHT" FOR THE TOUGHEST ROCK

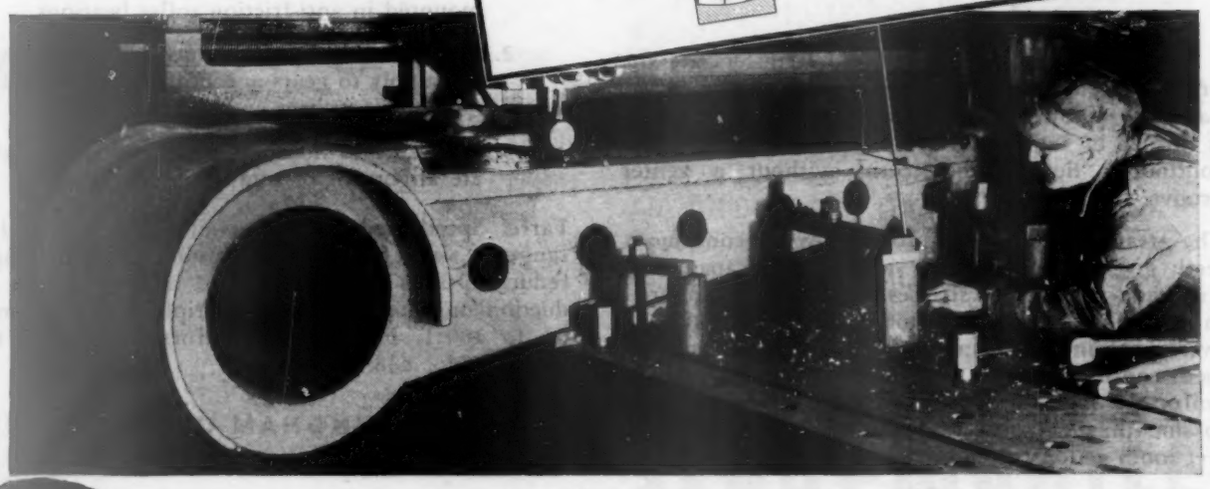


1. Fabricated Steel Plate Frame with multiform ribbing for maximum strength.
2. Precision Machined High Tensile Steel Alloy Eccentric Shaft, Locomotive Type Roller Bearings with dust tight seals.
3. Box Pitman with Internal Cross Ribs of High Tensile Cast Steel.



We Sincerely Believe
Our **NEW JAW CRUSHERS**

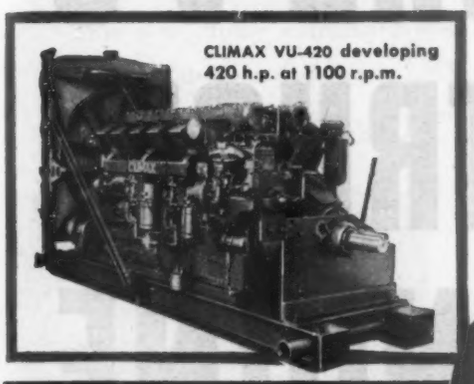
Are the finest crushers we have ever made . . .
And we've been making them for over 40 years.



GRUENDLER

CRUSHER & PULVERIZER CO. • ST. LOUIS 6, MO.

THE ENGINE for the job!



climax
BLUE STREAK ENGINE
Builder of Climax DIESELS and GENERATING SETS
CLIMAX ENGINEERING COMPANY

IN-LINES . . . V-TYPES . . . DIESELS . . . Compact Economical Work Engines for Every Power Need from 6 to 495 Horsepower

DISTINGUISHED for service records of 15, 20 and 25 years of heavy duty service—up to 24,000 hours with no major overhaul—sturdy, precision-built Climax Engines deliver unfailing, day-by-day, low-cost power to boats, locomotives, pumps, blowers, compressors, conveyors, hoists, electrical generators, construction equipment, cranes, power shovels, drag lines, rock crushers, power saws, oil well deep-drilling rigs, pipeline pumping stations, etc.

★ ★ ★

In Climax Engine Driven Generating Sets—Models from 5 kw to 250 kw—they supply power and light, for less than 1 cent per kw, to schools, airports, construction jobs, etc., and dependable, instant-starting standby service to industrial plants, sewage plants and water works, institutions and public power stations.

They are built to operate on lowest cost, available fuels, the Diesels (20 and 40 h.p.) on Diesel fuel oil, the Blue Streak models on natural or by-product gas, on butane or gasoline. From the smallest to the largest, they are rugged, dependable, prime movers. built to take the hardest kinds of industrial, marine and field service.

Investigate Climax performance before you invest in any engine. Write for bulletins and catalog—Climax Engineering Company, Clinton, Iowa.

CLIMAX ENGINEERING COMPANY
General Offices: Clinton, Iowa
REGIONAL OFFICES
Chicago *Dallas* *Ft. Worth*
New York *Los Angeles*

AN IMPORTANT ENGINEERING ADVANCEMENT

Ford Announces

NEW DEVELOPMENTS

in the Heavy Duty 100 H.P.

FORD V-8 TRUCK ENGINE

Ford

Here's Good News

FOR TRUCK OPERATORS

The Model 59 engine is now offered as original equipment only. It will eventually be made available as a service replacement in Ford Trucks and Commercial units already on the road.

Here are some of the important improvements in this engine:

NEW long-life Tri-Alloy connecting rod bearings . . . **NEW** aluminum alloy pistons with four rings for oil economy . . . **NEW** larger capacity oil pump with more screen area for improved lubrication . . . **NEW** crankshaft rear bearing oil seal . . . **NEW** rust-proofed valve springs . . . **IMPROVED** cooling of valve seats . . . **NEW** flat-type waterproof distributor with full automatic advance and vacuum control . . . **NEW** high efficiency fan . . . **IMPROVED** carburetion . . . **IMPROVED** intake manifold for easy vacuum pipe connections . . . **SIMPLIFIED** design provides easier accessibility for service . . . clutch can be replaced without removing oil pan . . . more parts are interchangeable, reducing the number of service items required.

IT'S HERE—the first of wartime truck engineering developments by Ford to be made available to civilian operators.

An improved Heavy-Duty, 100 H.P. V-8 Engine now powers Ford Trucks and Commercial units which are in limited production for civilian priority holders.

This great power plant is the Model 59. You'll be hearing a lot about its fine qualities. It includes many of the Ford Truck engineering advancements made in response to military needs which are proving valuable in civilian trucking.

These improvements, affecting virtually every operating part of the engine, raise Ford Truck engine performance to new high levels of stamina, economy and efficiency—with new and important *service* benefits of interest to every truck owner and maintenance man.

Read about them in the text at the left.

FORD MOTOR COMPANY

"Riding Comfort"
FOR INDUSTRIAL MACHINES

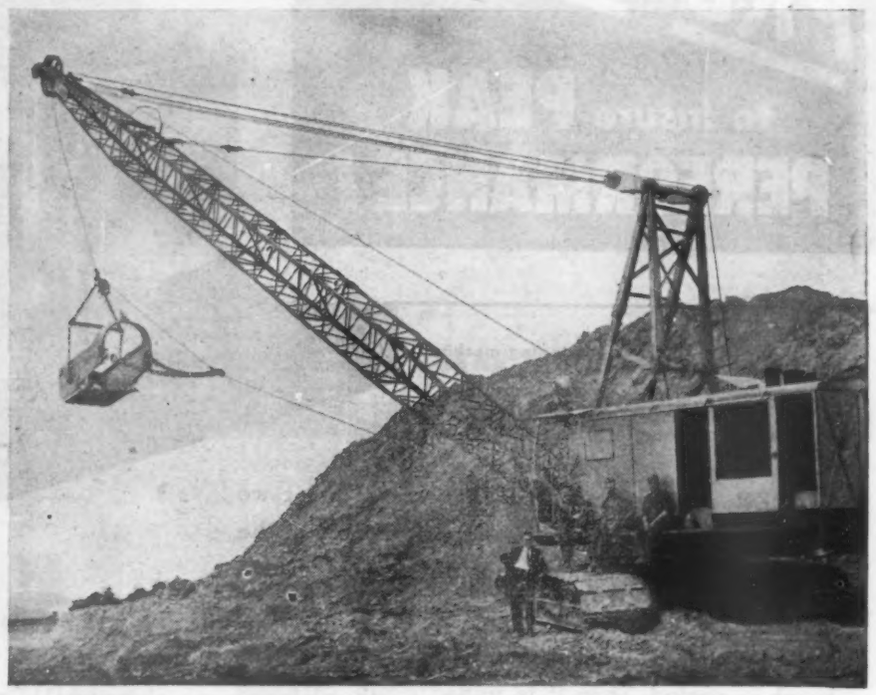
Smooth operation, and freedom from shocks and vibration, are just as important in your heavy-duty machines as they are in your motor vehicles.

Now, for the first time, you can give your machines true air-cushioned "riding comfort" with the Fawick Airflex Clutch.

This new clutch controls power and torque through a cushion of air and rubber. Regulated inflation gives you clutch engagement as light or as firm as the job demands. There are no springs, arms or toggles, no adjustments to make, no lubrication required. Misalignment is corrected automatically. Maintenance costs are usually low. Both drive and driven members have new nonmetallic safety and protection.

Our experienced engineering department will gladly give you recommendations for your machines.

THE FAWICK AIRFLEX CLUTCH provides air-cushion clutch action because it matches today's fine motor vehicle tires in quality of material and excellence of workmanship — the result of the great technical advances made by America's Rubber Industry.



For shovels, cranes and draglines, Fawick Clutches stand fast starts and stops, shock, strain and vibration. Maintenance costs are unusually low—equipment *stays* in service.

FAWICK AIRFLEX COMPANY, INC. • **9919 Clinton Rd. Cleveland 11, Ohio**

In Canada, **Renold-Coventry Ltd., Montreal, Toronto, Vancouver** • *In Britain,* **Crofts Engineers, Ltd., Bradford, England**

FAWICK *Airflex* CLUTCH

POWER CONTROLLED BY AIR

Cleveland Drills being run-in.

Actual tests on the rock.

The testing machine.

CLEVELAND ROCK DRILLS are PRE-TESTED to insure PEAK PERFORMANCE!

WHEN a Cleveland Drill leaves our plant we *KNOW* it will give peak performance in the field. For every Cleveland model receives extensive testing as soon as it is built.

As the first step, every machine undergoes a 4-hour break-in period. Then it is pulled down, carefully examined and re-oiled. Secondly, at regular intervals, machines are taken from the run-in line and are operated in actually drilling rock.

Then, every unit is placed on our testing machine. This machine hydraulically transmits the drill's blows to a diaphragm which in turn registers on a moving tape. Card records of each test are kept, showing (1) The number of blows struck per minute, (2) force of blow in foot-pounds and (3) the rate of air consumption of each drill.

This careful pre-testing, along with their modern design and skillful manufacture, explain why Cleveland Drills perform so well on the job.

LEADERS IN DRILLING EQUIPMENT

THE CLEVELAND ROCK DRILL CO.

DIVISION OF THE CLEVELAND PNEUMATIC TOOL COMPANY

CABLE ADDRESS: "ROCKDRILL" • CLEVELAND 5, OHIO

BRANCH OFFICES

Birmingham 1, Ala.	Lexington 19, Ky.	Salt Lake City 1, Utah
Butte, Mont.	Los Angeles 11, Calif.	San Francisco 3, Calif.
Denver 2, Colo.	Newton Highlands 61, Mass.	St. Louis 3, Mo.
El Paso, Texas	New York 6, N. Y.	Wallace, Idaho
Ironwood, Mich.	Philadelphia 30, Pa.	Washington 5, D. C.

CANADIAN DISTRIBUTORS

Purves E. Ritchie & Son, Ltd., 658 Hornby Street, Vancouver, B. C.

Only ENTERPRISE Vertical Mills give you all 8 benefits needed for modern production

HIGHER OUTPUT . . . Up to 4¼ tons of asbestos rock per hour.

LESS OPERATING POWER . . . Only 40 HP at 1800 rpm required for this output.

LONGER LIFE . . . Hundreds of Enterprise Vertical Mills have been in use for years.

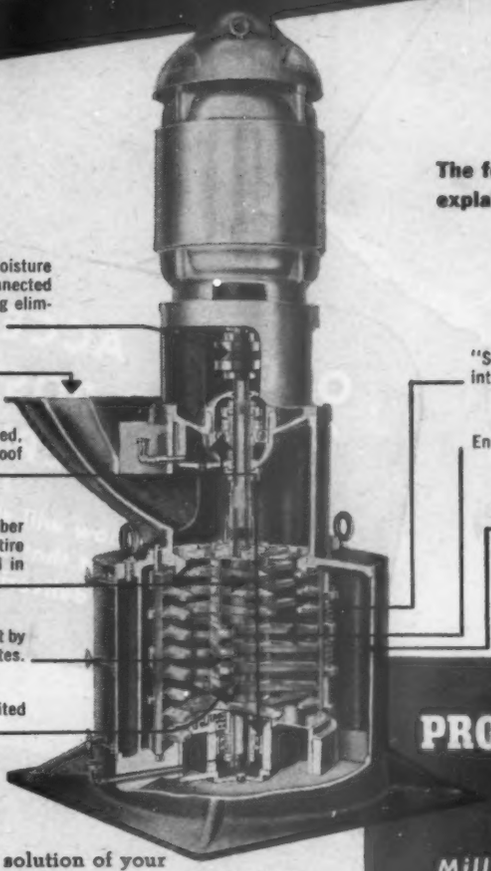
LESS MAINTENANCE . . . Durable materials used throughout, rigidly assembled.

FASTER SERVICING . . . Fewer working parts which are replaceable in minutes.

LESS WEIGHT AND SPACE . . . Only 40 inches square at base, 68 inches high, 3000 pounds.

QUIET, VIBRATIONLESS OPERATION . . . Vertical construction permits even load over entire rotor.

FLEXIBILITY . . . You can use any one of nine interchangeable rotor assemblies to meet conditions . . . change screens to various degrees of fineness.



HERE IS PROOF!

The features of Enterprise Vertical Mills illustrated explain why Enterprise offers you these 8 benefits

Heavy duty motor, enclosed in moisture and dust proof compartments connected directly to shaft by flexible coupling eliminating power transmission losses.

Down feed, down discharge.

Trouble-free bearings, fully lubricated, enclosed in dust and moisture proof housings.

Material in disintegration chamber surrounds rotor so that the entire revolution of the rotor is engaged in useful work.

Hammers locked on solid steel shaft by locking rings are changed in minutes.

Leading edges of hammers stellited for longer life.

"Swing-away" comb rack prevents damage to mill if metal is accidentally fed into disintegrating chamber.

Entire screen area discharges finished material.

Simple construction with parts machined to fit. No crevices for materials to lodge.

For a simple low-cost solution of your problems of grinding, mixing, macerating, shredding or pulping, there is an Enterprise Vertical Mill to meet your needs. Write today for full information on models and applications. Address Dept. J-7.

PROCESS MACHINERY DIVISION
OF ENTERPRISE ENGINE & FOUNDRY COMPANY

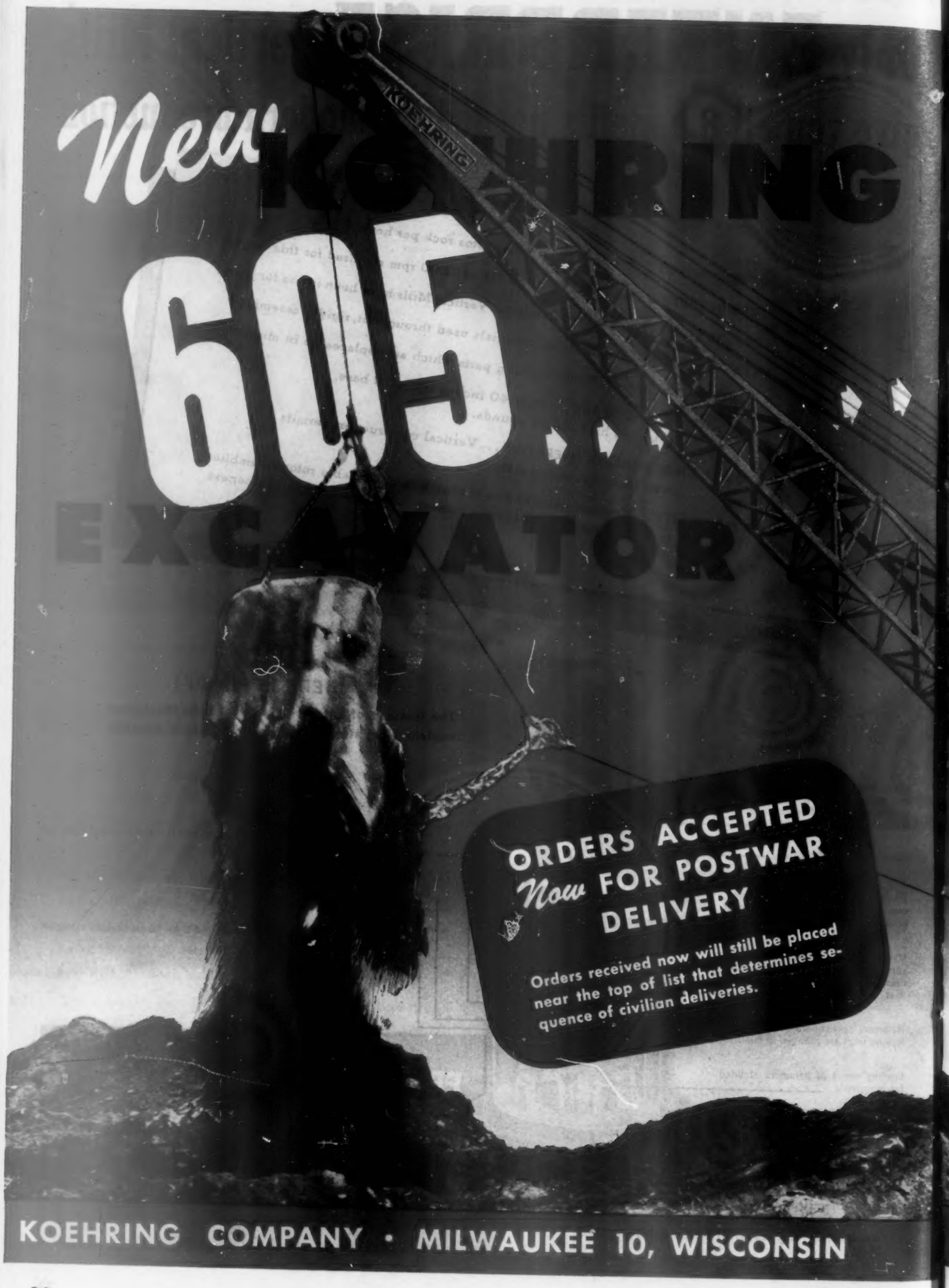
Mills · Presses

Cookers · Dryers

18th and Florida Sts.

San Francisco, Calif.

E-4720-16


New
KOEHRING
605
EXCAVATOR
ORDERS ACCEPTED
Now FOR POSTWAR
DELIVERY
Orders received now will still be placed near the top of list that determines sequence of civilian deliveries.
KOEHRING COMPANY • MILWAUKEE 10, WISCONSIN

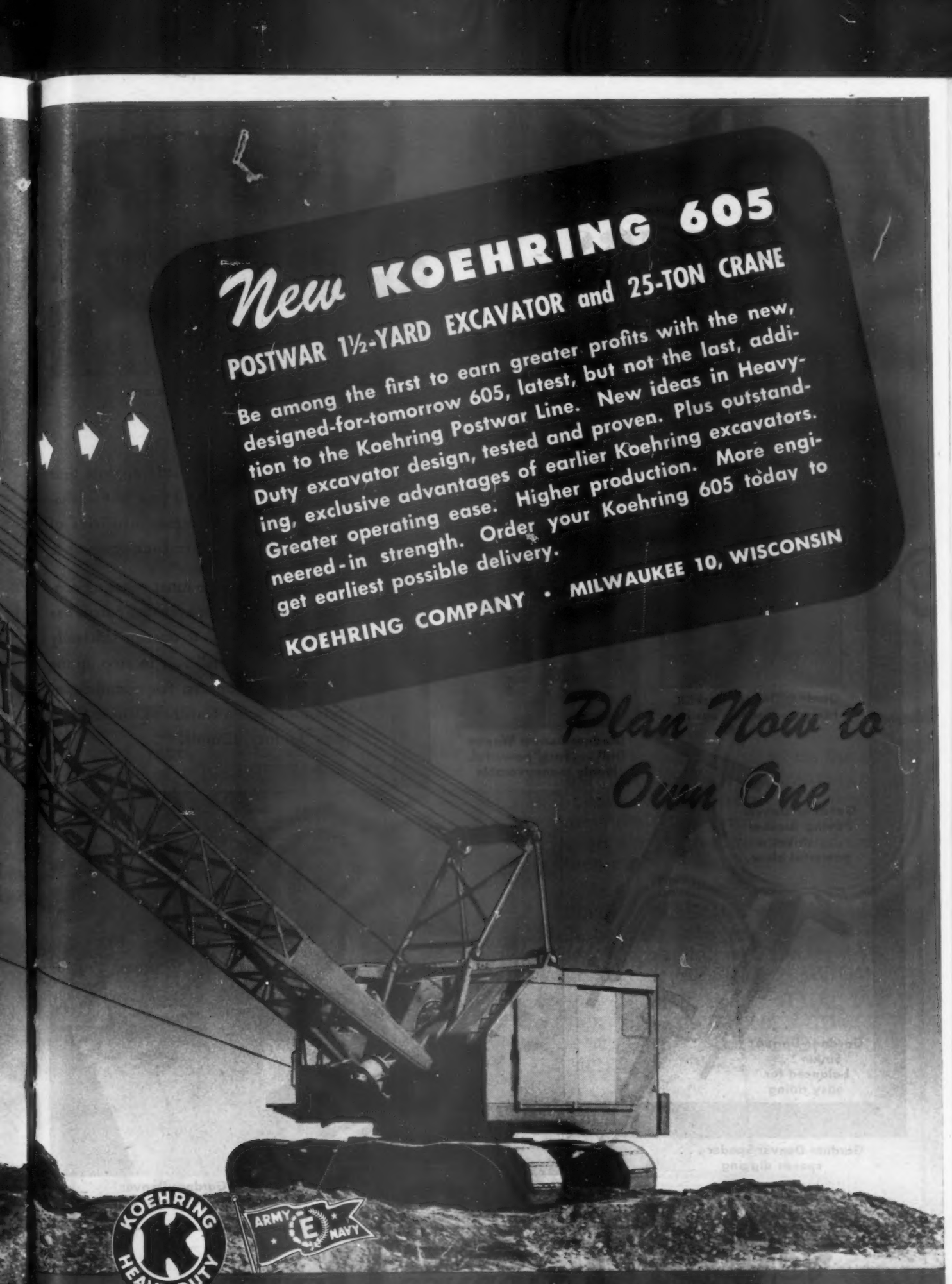
New KOEHRING 605

POSTWAR 1½-YARD EXCAVATOR and 25-TON CRANE

Be among the first to earn greater profits with the new, designed-for-tomorrow 605, latest, but not the last, addition to the Koehring Postwar Line. New ideas in Heavy-Duty excavator design, tested and proven. Plus outstanding, exclusive advantages of earlier Koehring excavators. Greater operating ease. Higher production. More engineered-in strength. Order your Koehring 605 today to get earliest possible delivery.

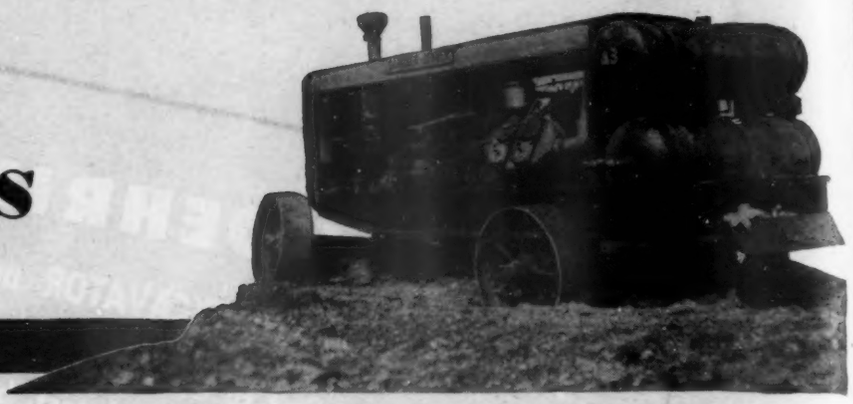
KOEHRING COMPANY • MILWAUKEE 10, WISCONSIN

Plan Now to Own One



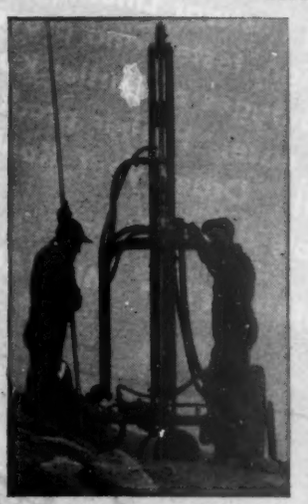
HEAVY DUTY CONSTRUCTION EQUIPMENT

PACE SETTERS



Gardner-Denver All Water-Cooled Portable Compressors. Available in either gasoline or Diesel power

Gardner-Denver Backfill Tamper . . . walks easily over the fill



Gardner-Denver Wagon Drill . . . fast, powerful, highly maneuverable

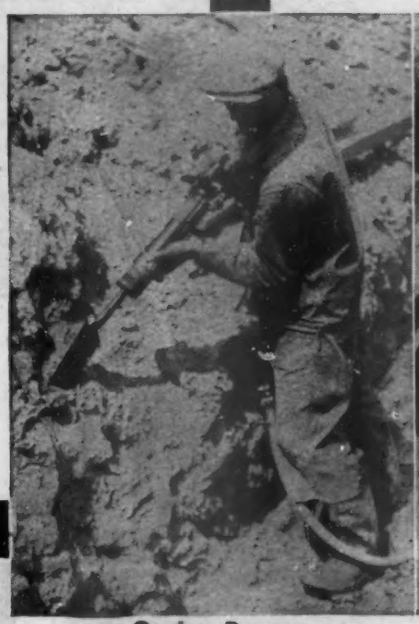
YOU can win the battle against time and tight schedules—*if* you take advantage of the pace-setting abilities of Gardner-Denver construction equipment.

Proved under the most exacting conditions, Gardner-Denver equipment has the built-in stamina to operate efficiently without "time-outs" . . . to step up the pace of job progress. For complete information, write Gardner-Denver Company, Quincy, Illinois.

Gardner-Denver Paving Breaker . . . strikes a powerful blow

Gardner-Denver Sinker . . . balanced for easy riding

Gardner-Denver Spader . . . speeds digging



Gardner-Denver Model 28-A Spader

Gardner-Denver Model 28-A Spader with Moil

GARDNER-DENVER *Since 1859*

MISSISSIPPI WAGONS GIVE PROFIT INSURANCE....

....WHERE MAXIMUM FLOTATION AND TRACTION ARE MANDATORY FOR HAULING FULL PAY LOADS

Contractors are assured "profit insurance" against tough hauling jobs in sand, mud, and loose dirt when they invest in MISSISSIPPI WAGONS, and here is why:

The MISSISSIPPI WAGON with unusually good flotation provided by the four-wheel trailer and tractor, together with the low-pressure drive tires, must only carry 30 pounds weight a square inch of ground contact area, as compared with 54 pounds weight a square inch with semitrailers hauling the same load.

This means profitable hauls over haul roads where semitrailers and other equipment either "bogs down" with a full payload, or operates with part-loads at a loss.

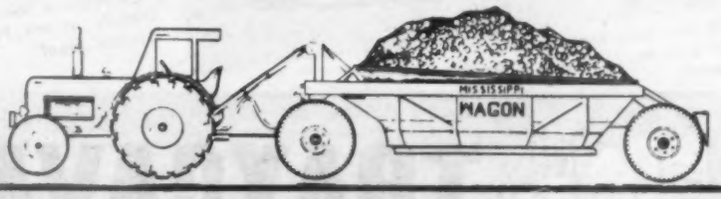
The low pressure tires used on the rear of the tractor require a maximum of only 12 pounds air pressure and provide approximately 350% more ground contact area than high-pressure load carrying tires used on semitrailer units.

Yes, Mr. Contractor, when you own MISSISSIPPI WAGONS you can bid the tough hauling jobs and know if any rubber tired hauling unit can do the job it will be your MISSISSIPPI WAGONS.

AND, IF IT IS A LONG HAUL OVER DEEP SAND YOUR ONLY COMPETITION WILL BE SOME OTHER OWNER OF MISSISSIPPI WAGONS.

"THE WORLD'S MOST MODERN HAULING UNIT"

MRS



MANUFACTURING CO.

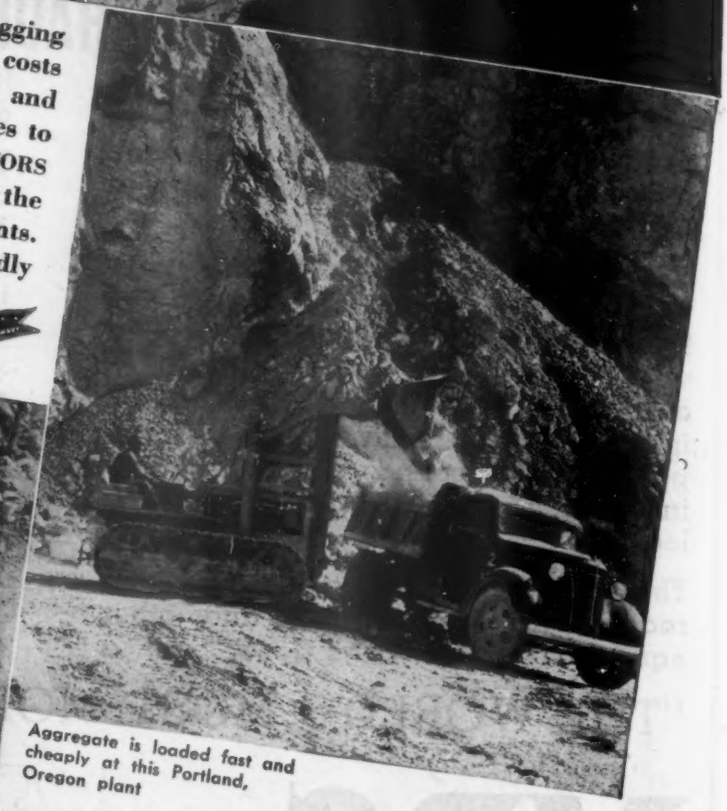
JACKSON, MISSISSIPPI

WHEN THERE'S WORK TO BE DONE...

TRAXCAVATE

PUT a TRAXCAVATOR to work on your digging and material-handling jobs and watch costs go down! Stripping overburden, digging and loading in the pit, carrying from stock piles to hopper — are some of the ways TRAXCAVATORS are cutting production costs and solving the manpower problem in busy brick and tile plants. Your TRACKSON-"Caterpillar" dealer will gladly give you the complete TRAXCAVATOR story, or write to TRACKSON COMPANY, Dept. PQ-75 Milwaukee 1, Wisconsin

Fifty tons per hour spells low cost loading at this El Paso, Texas, quarry



Aggregate is loaded fast and cheaply at this Portland, Oregon plant

PORTABLE "POWER HOUSE" DRIVES THIS CRUSHING PLANT

WITH two "Caterpillar" Diesel-Electric Sets "traveling de luxe" in their own private trailer, they can park well out of the "dust zone"—and supply the motor-driven equipment of this crushing plant with all the power it needs.

Though "Caterpillar" Diesel Engines have air, oil and fuel filters, and inbuilt seals to protect their vital parts against dust, dirt and grit, the portable shelter provides an additional safeguard. It also means maintenance economies because of less filter service.

The owners of this plant, Gallagher & Nelson, Madison, Wis., have standardized on "Caterpillar" Diesel equipment—with a D6 Tractor, a No. 12 Motor Grader, a D13000 Engine and the two 17-85S Diesel-Electric Sets mentioned above. Thus, they give themselves the advantages of low-cost workpower* backed by the mechanical and replacement-parts service of one efficient, thoroughly equipped manufacturer-dealer organization.

CATERPILLAR TRACTOR CO. • PEORIA, ILLINOIS

*When buying horsepower, remember: The horsepower of "Caterpillar" Diesel Engines is ALL WORKPOWER. Ratings show sustained output of a fully equipped engine—not the momentary peak performance of a power-plant stripped of fan, pumps and other necessary accessories.

CATERPILLAR REG. U.S. PAT. OFF. **DIESEL ENGINES**

TRACTORS • MOTOR GRADERS • EARTHMOVING EQUIPMENT

The discharged veteran wears this emblem. Remember his service and honor him.

Are you sinking good money in too-heavy pipe?

IF VERIFIED, this will be the only case in history of heavy pipe sinking a sizable ship, *but* . . . industry sinks a lot of money every year in pipe heavier than necessary for the plain, every-day services like those listed below.

Look at this list. Note that it covers the kind of applications for which Standard Thickness pipe is customarily used. And yet it has been conclusively proved in hundreds of plants that light-but-strong Taylor Spiral Pipe can handle jobs of this kind with strength and service life to spare.

Such plants have simply gotten away from the old tradition of using Standard Thickness pipe for everything that doesn't call for still heavier pipe. And by so doing they have in many cases cut the installed cost of piping squarely in half.

Taylor Spiral does the work of heavier pipe because its spiral construction gives it remarkable strength in proportion to its weight. As a matter of fact, the spiral seam, running from end to end, gives it greater bursting strength, greater collapsing strength, greater longitudinal stiffness than even seamless pipe of equal gauge.

Switching to Taylor Spiral Pipe for services like those listed is made easy by the complete range of sizes and wide variety of fittings. Thicknesses range from 12 to 8 gauge; sizes from 6" to 42"; joint lengths up to 40 ft. All types of end joints and couplings, all kinds of fittings and specials or fabricated assemblies are produced by Taylor Forge & Pipe Works, assuring complete service and undivided responsibility.

TAYLOR FORGE & PIPE WORKS

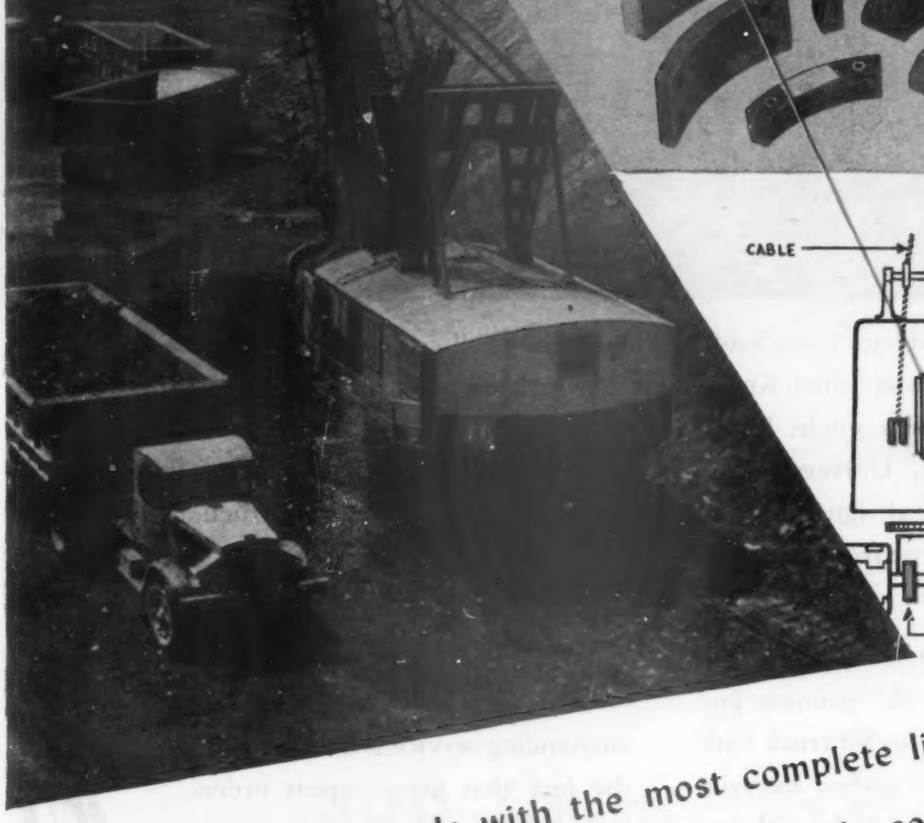
General Offices & Works: Chicago, P. O. Box 485 ★ New York Office: 50 Church St. ★ Philadelphia Office: Broad Street Station Bldg.

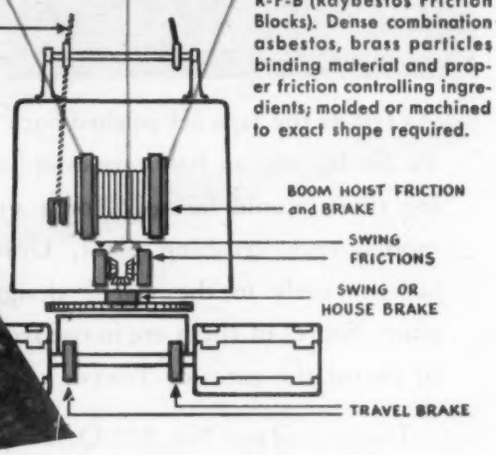
CHANGE TO TAYLOR SPIRAL PIPE FOR:

- High and Low Pressure Water Lines
- Low Pressure Steam and Air Lines
- Steam and Diesel Exhaust Lines
- Vacuum and Suction Lines
- Blower Piping
- Sand and Gravel Lines
- Industrial Gas Lines
- Oil and Gas Gathering Lines
- Swing Pipe
- Spray Pond Piping
- Hydraulic Mining
- Dredge Lines

The LEADER must LEAD

Raybestos Leads in Supplying Friction Material for Industry





R-F-B (Raybestos Friction Blocks). Dense combination asbestos, brass particles binding material and proper friction controlling ingredients; molded or machined to exact shape required.

Raybestos leads with the most complete line of friction materials for road builders, shipyards, contractors, and in farming, mining, lumbering and coal stripping operations.

THE RAYBESTOS DIVISION of Raybestos-Manhattan, Inc., BRIDGEPORT, CONN.

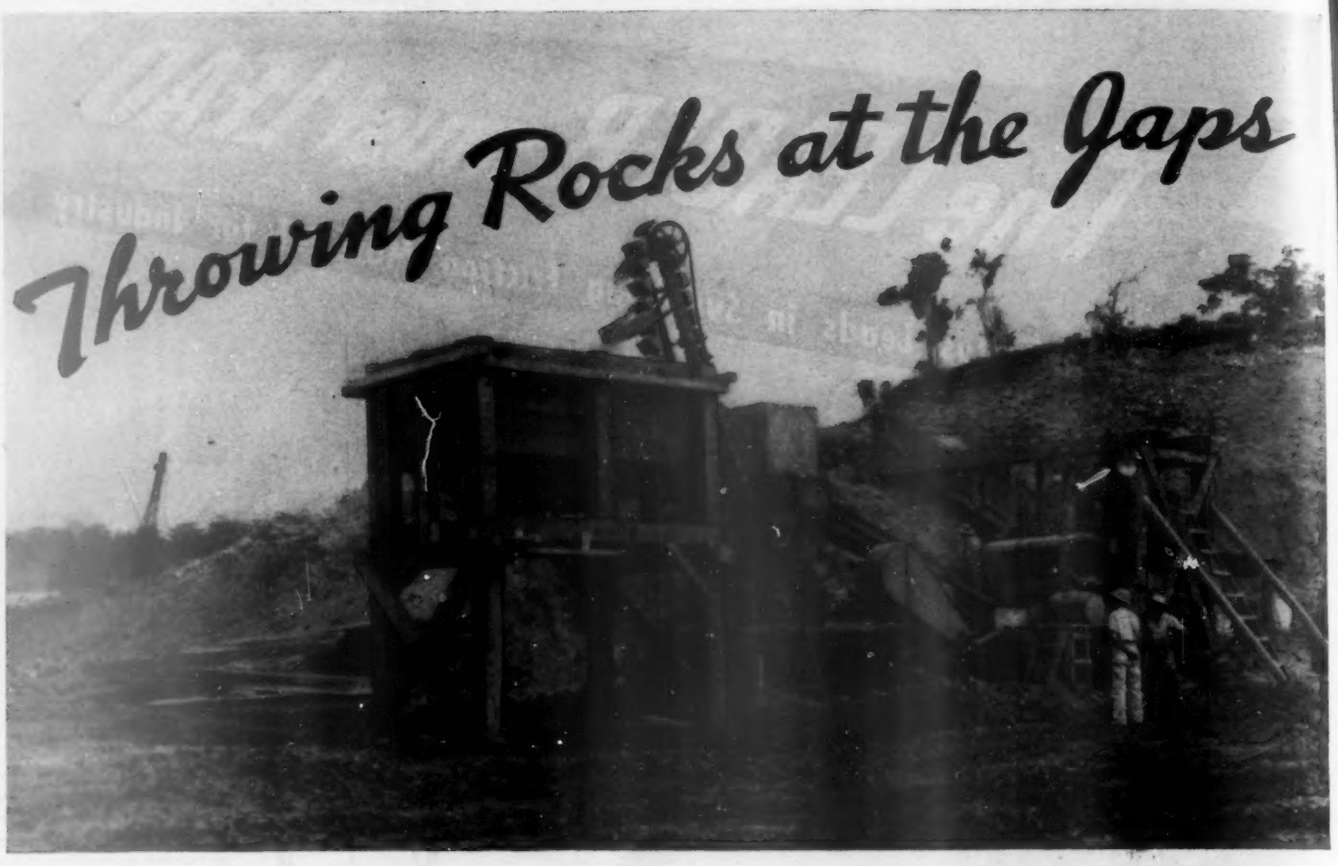
Raybestos

INDUSTRIAL FRICTION MATERIALS

BUY AN EXTRA BOND

MANUFACTURER of FULL METALLIC, SEMI-METALLIC, WOVEN and MOLDED FRICTION MATERIALS.

Throwing Rocks at the Japs

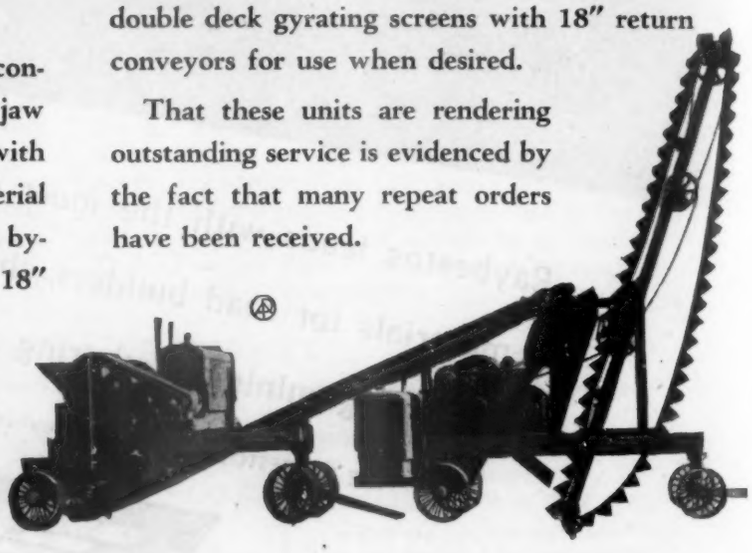


As fast as the Japs are pushed back from South Pacific Islands, air bases are established. Knowing there would be need for a single, highly mobile rock crushing plant, Universal engineers — early in the war — designed such a plant. Scores of them are in use from Australia to almost the gates of Tokyo.

Designated our No. 522-Q, these plants consist of a 20″ x 36″ Series "SL" primary jaw crusher mounted on a steel-wheeled truck with power unit and conveyor. Crushed material from the primary is fed to a grizzly with by-pass placed over the truck-mounted 30″ x 18″ secondary roll crusher, oversize chuting to the roll crusher and throughs going to a bucket elevator boot. Elevator discharges into bin made of native materials to load trucks for hauling to landing strips under construction.

All the plants are provided with 3′ x 8′ double deck gyrating screens with 18″ return conveyors for use when desired.

That these units are rendering outstanding service is evidenced by the fact that many repeat orders have been received.



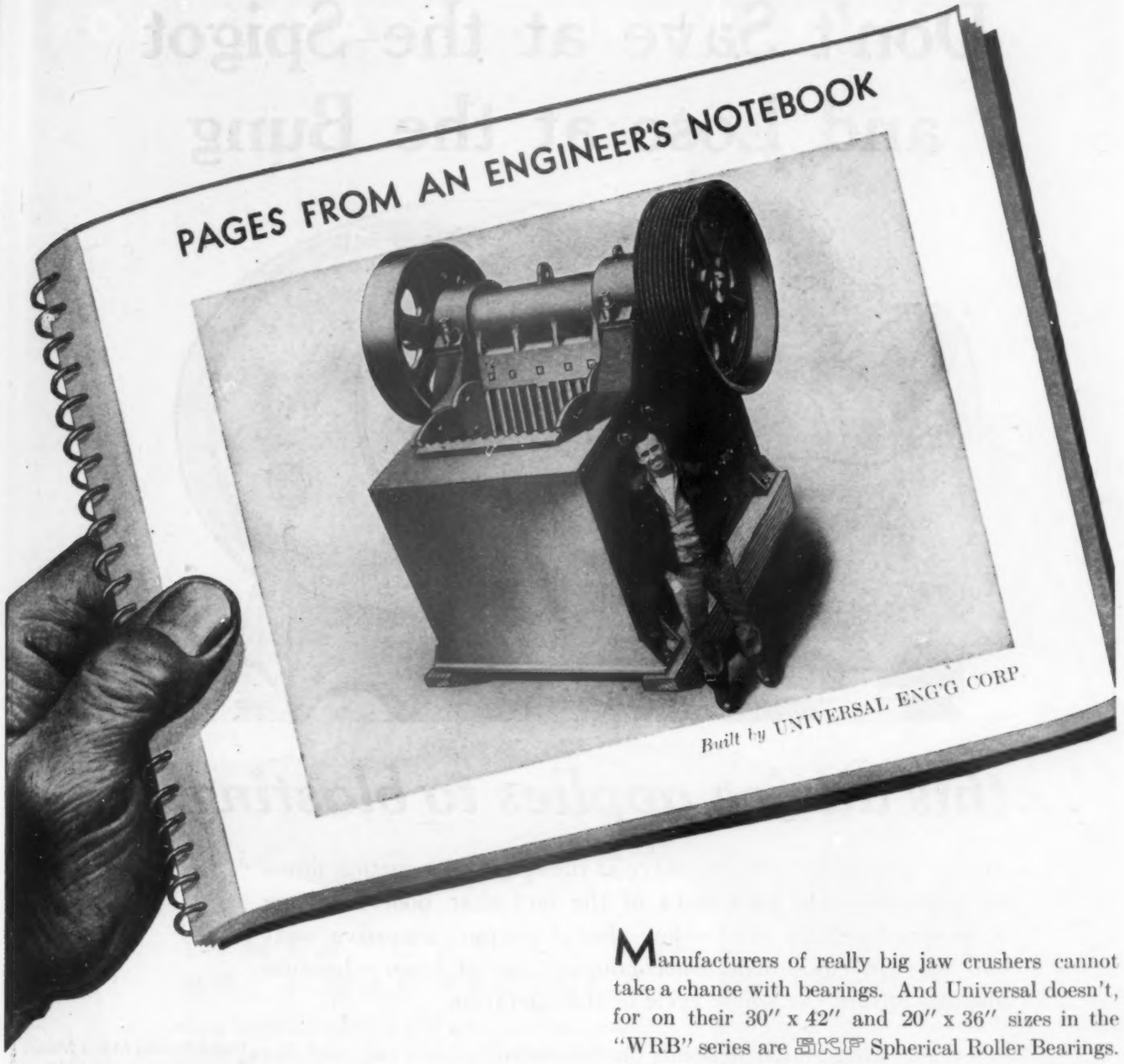
UNIVERSAL ENGINEERING CORPORATION

619 C Ave. West, Cedar Rapids, Iowa

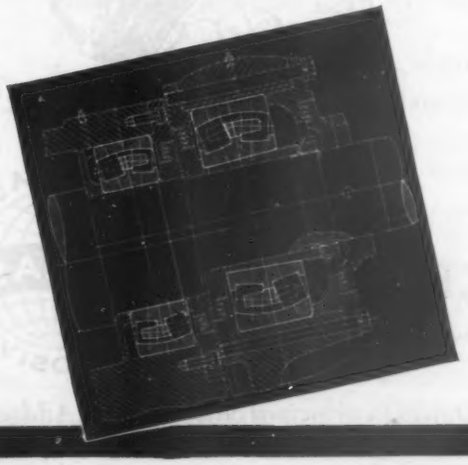
ARMY NAVY

UNIVERSAL

ROCK AND GRAVEL CRUSHERS, CRUSHING ROLLS, HAMMER MILLS, COMPLETE CRUSHING AND SCREENING PLANTS, WASHING PLANTS, ASPHALT PLANTS, SPREADEROLLERS.



300 T.P.H. ON SKF BEARINGS



Manufacturers of really big jaw crushers cannot take a chance with bearings. And Universal doesn't, for on their 30″ x 42″ and 20″ x 36″ sizes in the "WRB" series are SKF Spherical Roller Bearings. Two of these SKF's are on the pitman, two others on the frame, and all are grease-lubricated . . . labyrinth sealed against grit. They have the stamina to absorb loads imposed continuously by crusher capacities up to 300 tons per hour . . . the self-aligning characteristics that prevent binding from shaft deflections due to high stresses. The bigger the job assigned to a machine, the greater the need for SKF Bearings. 5835

SKF INDUSTRIES, INC., PHILA. 34, PA.

SKF
BALL AND ROLLER BEARINGS

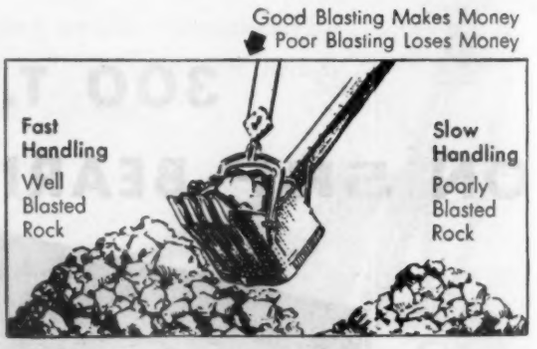
Don't Save at the Spigot and Lose at the Bung

...this advice applies to blasting, too

Many a blaster has tried to "save at the spigot" by cutting down on explosives. He loses sight of the fact that poor breakage means really high costs — low shovel output, excessive wear and tear on equipment, uneconomical use of labor — because blasting affects the whole cycle of the operation.

Good blasting, which depends on the use of the right explosive in the right way, means full shovel loads. It helps hauling costs and crusher production. It cuts down delays, idle manhours, and the need for secondary blasting.

For such *real thrift*, make use of the knowledge of the Atlas Representative. He can often produce real operating economies.



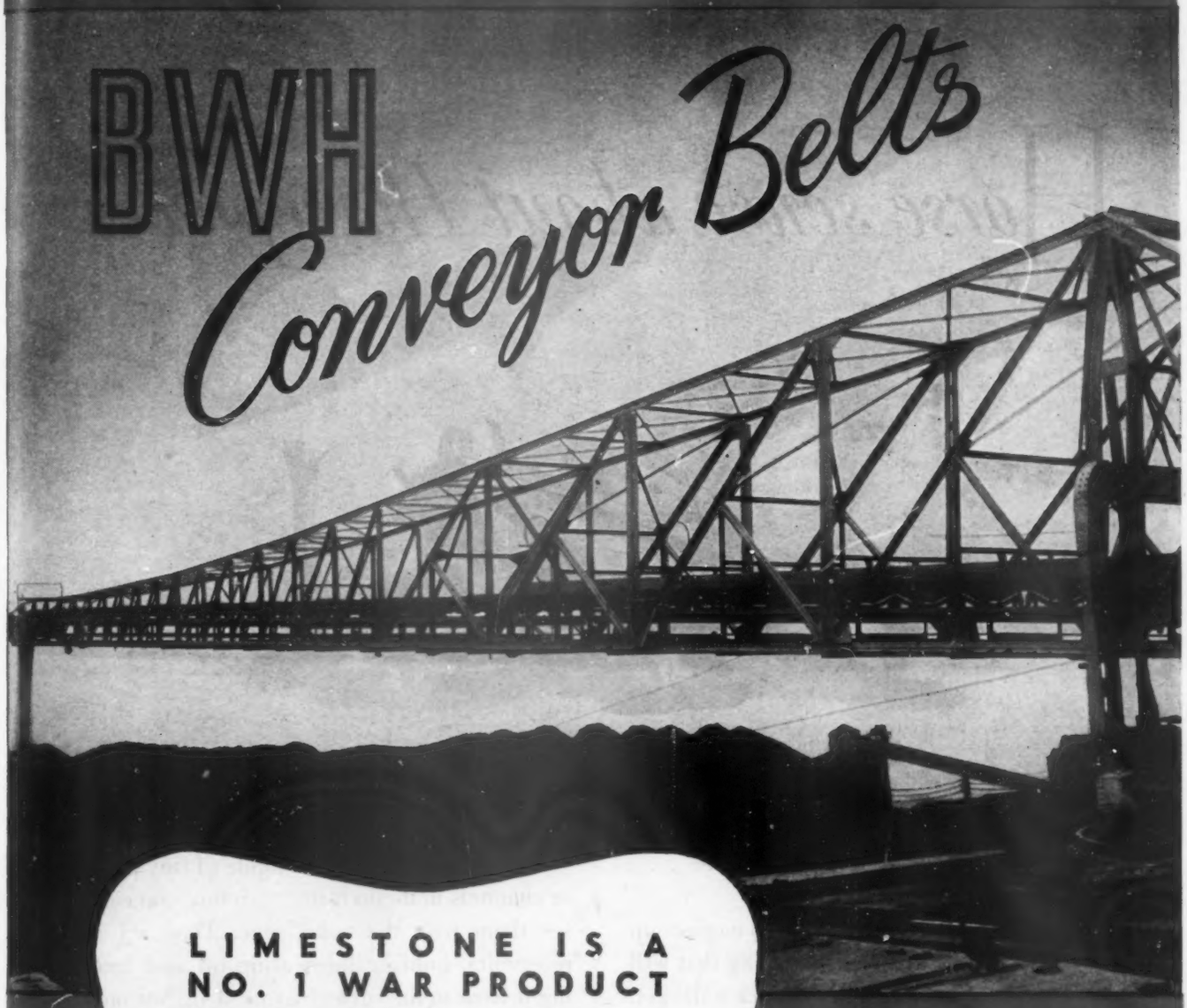
ATLAS EXPLOSIVES
"Everything for Blasting"

CHEMICALS ATLAS EXPLOSIVES

ATLAS POWDER COMPANY, Wilmington 99, Del. • *Offices in principal cities* • *Cable Address—Atpowco*

FOR GREATER PRODUCTION . . .

BWH Conveyor Belts



LIMESTONE IS A NO. 1 WAR PRODUCT

It is used in making pig iron, calcium carbide, acetylene gas and synthetic rubber.

Here is a Bull Dog conveyor belt 454 ft. long and 48 inches wide on a boom on the Steamer "Conneaut" owned by the Wyandotte Transportation Company. It has been in service 6 years, during which time it has handled over five million tons of stone and coal.

A BWH belt was chosen for this job because it meets squarely the heavy punishment involved in moving great abrasive masses at high speeds and at minimum cost.

Wherever belts must possess the unusual in ruggedness and dependable long life, be sure to consult our nearest distributor or field technician, or write us direct.

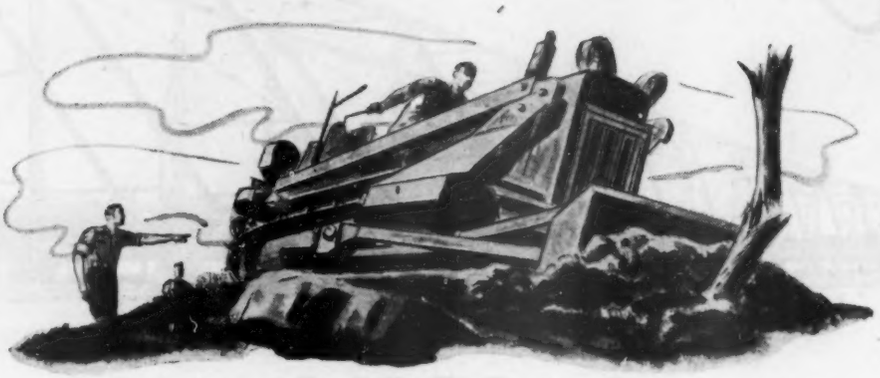
BOSTON WOVEN HOSE & RUBBER COMPANY

FACTORY: CAMBRIDGE, MASS., U.S.A.

P. O. BOX 1071, BOSTON, MASS., U.S.A.

BOSTON WOVEN HOSE AND RUBBER COMPANY

Horse sense about Horsepower



Common, ordinary horse sense tells us that worn cylinders mean lost horsepower . . . and horsepower costs money.

To cut down this waste and keep engines up to top efficiency, we need something that will stand up to the beating that cylinder walls get. At least, that's what Hendrik van der Horst figured . . . and several years ago he discovered a cylinder wall surface that multiplies cylinder life 4 to 20 times.

Van der Horst discovered a method of bonding a thick layer of chromium to the cast iron of the cylinder bore and then giving it a "porosity treatment". Everybody knows that chromium resists corrosion and that it is almost as hard as diamonds. But the unusual feature of Van der Horst's PORUS-KROME is the porous nature of its surface.

PORUS-KROME has thousands of tiny pores or channels in its surface . . . so tiny you can't see them with the naked eye. They act as reservoirs, holding lubricating oil and feeding it back to the surface as needed. Not only does PORUS-KROME make cylinder walls last longer, but it also multiplies the life of the conventional rings 3 to 5 times.

These are the reasons so many Army and Navy engines have PORUS-KROME in their cylinders. And it's just good horse sense to plan to have it in your engines, too. Write for booklet telling all about PORUS-KROME.

Van der Horst Corporation of America, Olean, New York. *Plants in Olean, New York and Cleveland, Ohio.*

PORUS - KROME

Good for the Life of your Engines

VAN DER HORST

SPEED & MOBILITY

FOR SMALL YARDAGE JOBS AROUND GRAVEL PITS AND QUARRIES

D TOURNAPULL

Self-loading on down grade or in light materials. Two units can push-load each other.

Tiltdozer on front increases usefulness. Handles light clearing, clean-up work, feeds hoppers.

16.1 mph speed, pneumatic tires, add to mobility, permit working on and off pavement, cut travel time.

Positive-ejection Carryall dumps loads fast on waste area or through grizzlies . . . or spreads surfacing material in even layers.

THE 44 h.p. Model D Tournapull is a handy money maker for small yardage jobs where its quick mobility, low cost and one-man operation save you time and money. High speed travel (16.1 mph) makes it highly desirable for odd job dirtmoving around any quarry or gravel pit.

Many Uses

With 2.3-yard Carryall Scraper, it will economically handle pit-road maintenance including load, haul and spread of surfacing material; strip overburden, load sand and gravel in small pits and dump through grizzly to plant conveyor belt. Tiltdozer handles light clearing; general clean-up work; cuts drainage ditches, etc.

Combines Load, Haul, Spread

Fast-moving, rubber-tired Tournapulls are the job-proved self-propelled Scraper units that have added truck hauling speeds to scraper self-loading, self-spreading economy. Simple and easy for one man to operate, they eliminate need for single-purpose equipment for excavating, hauling and spreading.

Their high-speed, off-road hauling ability—2 to 3 times faster than the fastest crawling tractor—enables you to move more material faster, farther and at lower costs.

Investigate Tournapulls NOW

Check with your LeTourneau distributor. Let him show you how the modern D Tournapull will cut costs on your small yardage jobs. Ask him, too, about the bigger 150 h.p. Super C Tournapull with 15-yard Carryall for your high production, big yardage operations. Call TODAY.

PQ4

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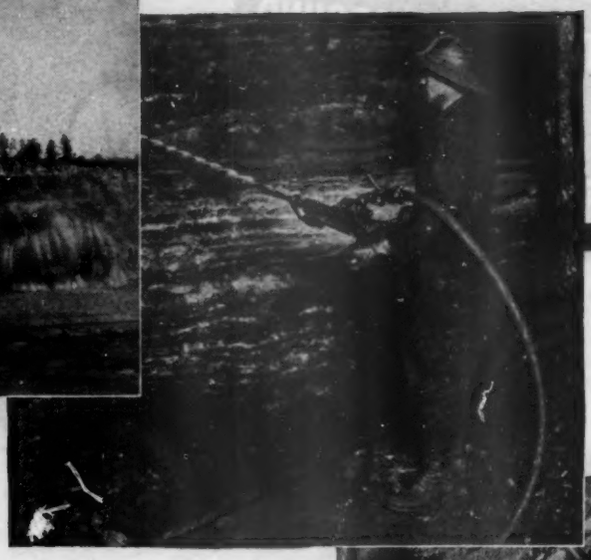

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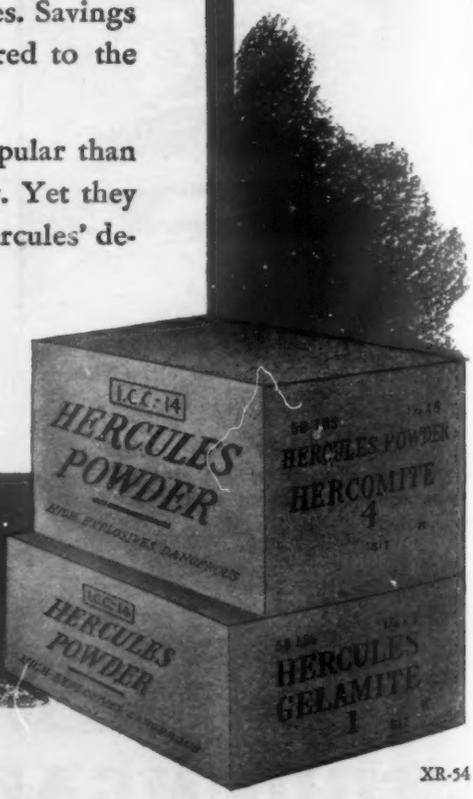
HERCULES



EXPLOSIVES DEPARTMENT
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*Reg. U. S. Pat. Off. by Hercules Powder Company

XR-54

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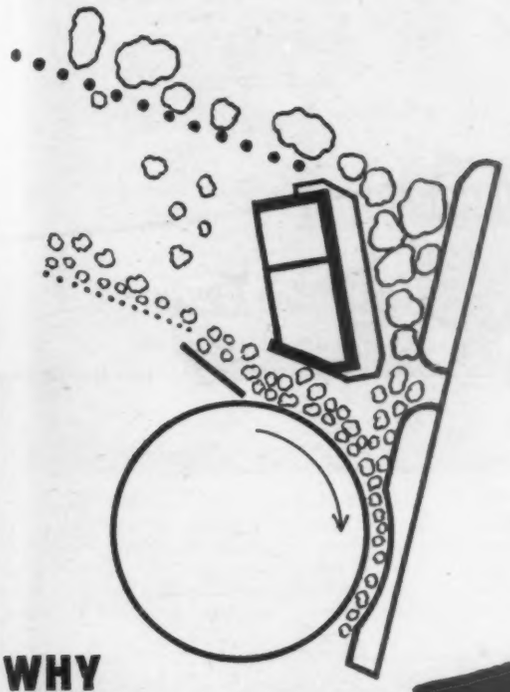

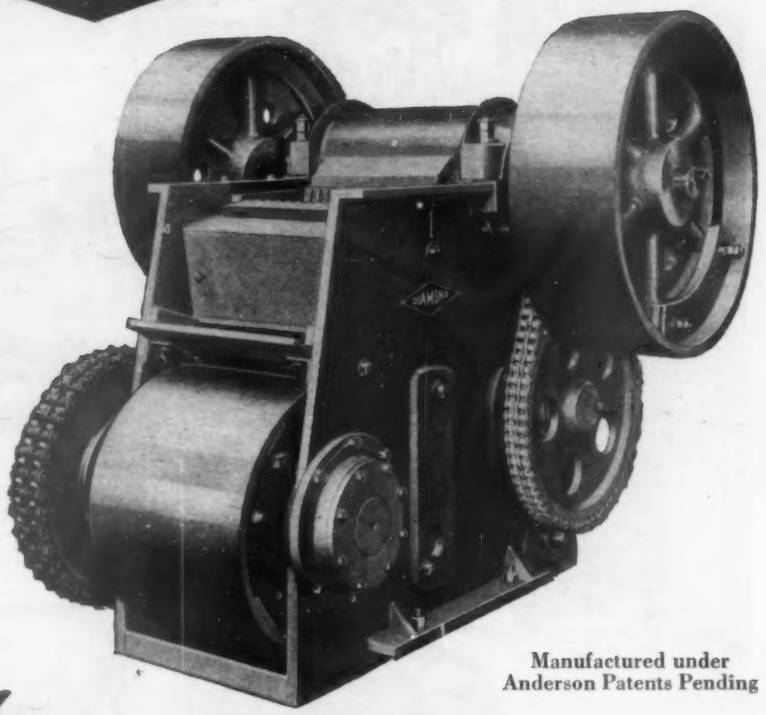

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WHY "DUAL ACTION" LEADS the FIELD

IN THE *NEW* DIAMOND "DUAL-ACTION" CRUSHER

Note the diagram above. The upper compartment is similar to usual jaw crusher design with stationary and movable jaws, and properly handles any stone up to capacity. The roll operates in perfect unison with the eccentric action of the lower part of the movable jaw, and this action (not gravity) forces the material through in a steady delivery without effort and without choking.

But, get the complete story of this sensational crusher from the new bulletin D-45-M. Ask your DIAMOND dealer, or write us.

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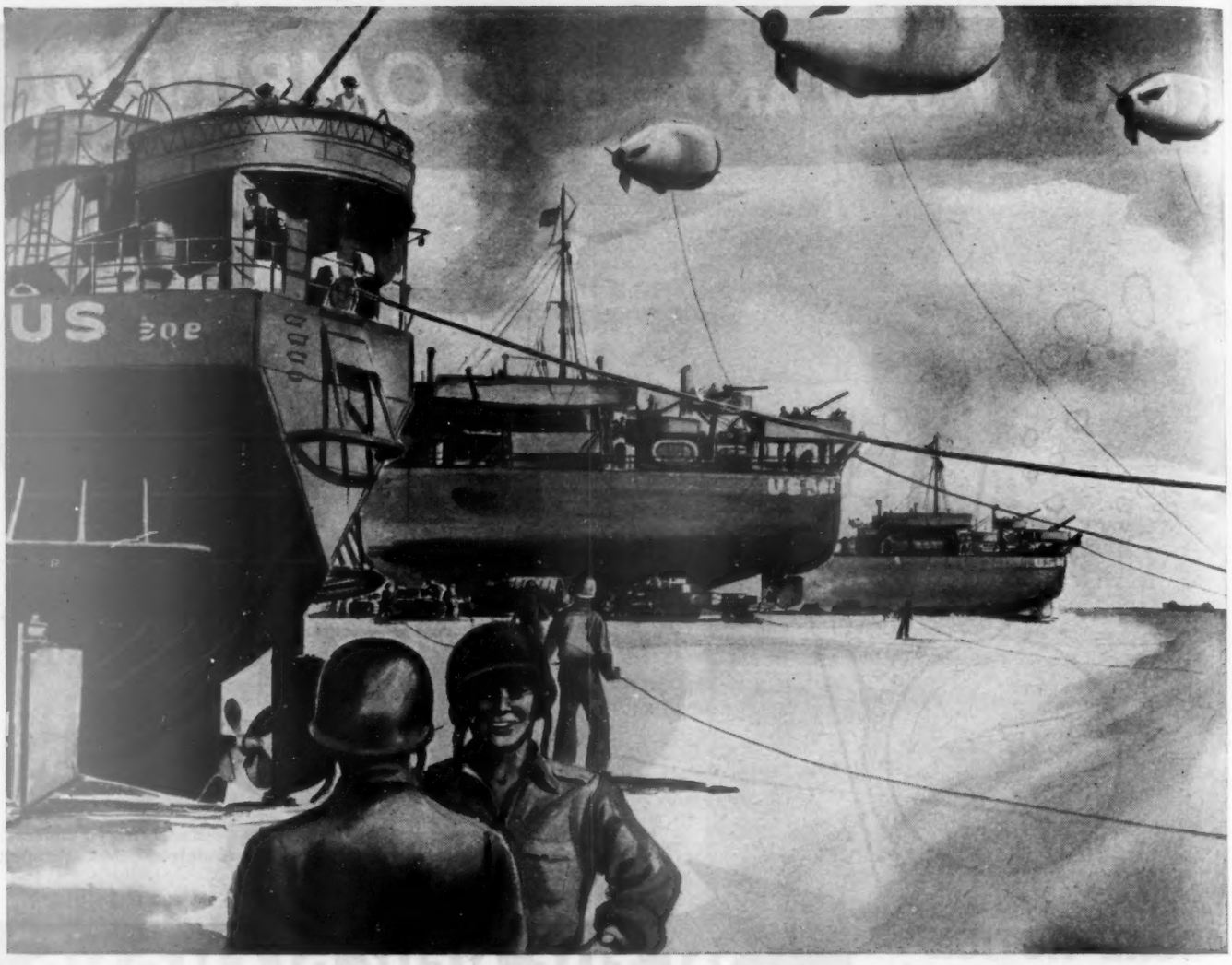

HOW TO REFLOAT AN LST

The LST (Landing Ship Tank) is built to be beached. But it must be refloated. Part of the trick lies in dropping anchor far off shore and paying out the 1 to 1¼ inch wire rope to which it is attached. Then, when the "ocean-going ferry" has unloaded its cargo and the tide is right, anchor winches go into action, engines are put in reverse and the LST floats itself.

This is one of scores of war jobs calling for dependable wire rope. A tough job? Yes . . . but no tougher than the hard use which Wickwire Spencer Wire Rope is taking every day on the home front. And because operators have discovered that Wickwire Rope "can take it," we've won their confidence. It looks, therefore, as if you'll see more Wickwire Rope in more places as fast as we can make it available.

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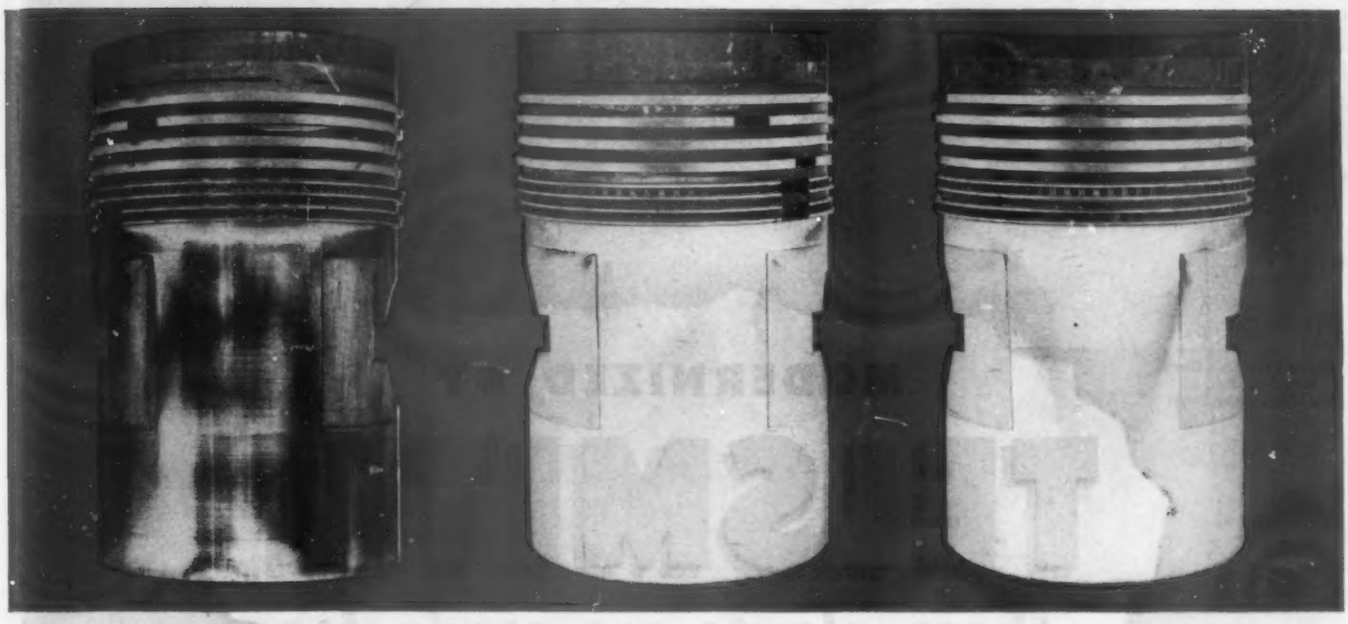
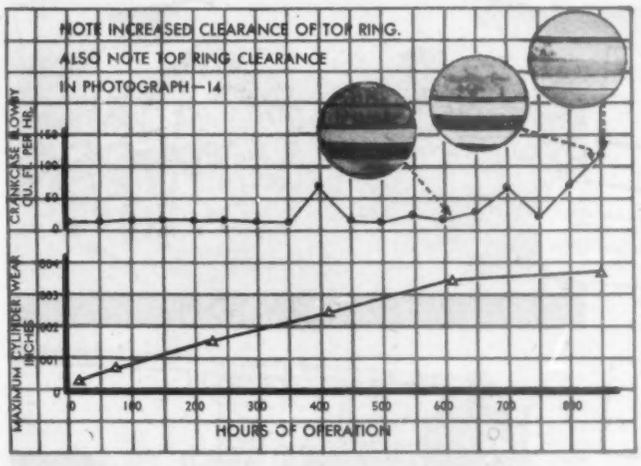
How RPM DELO OIL prevents ring sticking

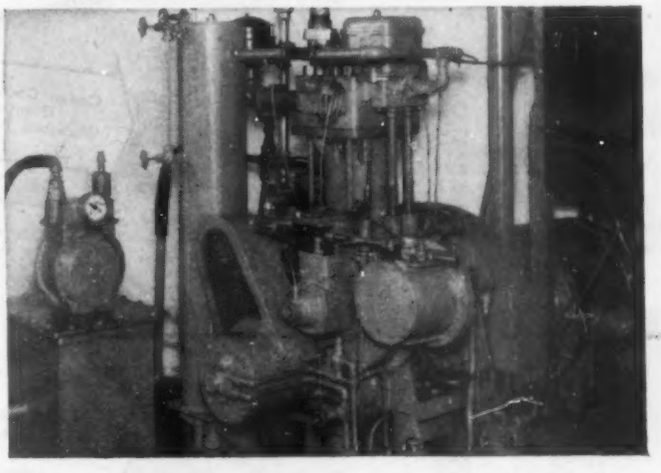


Even the finest uncompounded mineral oil will leave deposits on rings and skirts when operated under severe engine conditions. The above photo shows a test engine piston after 264 hours operation with the finest obtainable uncompounded Diesel engine oil.

Here's the same test made with RPM DELO Oil, only this time for 1000 hours—more than double the 480-hour test required in current military specifications. The photographs above show both thrust and anti-thrust sides of a piston after a 1000-hour test with RPM DELO Diesel Engine Lubricating Oil. Note that RPM DELO Oil has almost entirely prevented any deposits on skirts. Dark areas around rings are only soft carbon, not sticky varnish. The compounding in RPM DELO Oil makes this possible by preventing the initial formation of sticky varnish.


NOTE INCREASED CLEARANCE OF TOP RING.
ALSO NOTE TOP RING CLEARANCE
IN PHOTOGRAPH—14
CRANKCASE BLOWBY CU. FT. PER HR.
MAXIMUM CYLINDER WEAR INCHES
HOURS OF OPERATION

How blowby caused by cylinder and ring groove wear increases rapidly is shown by the above chart. Excessive side clearance caused by ring groove wear allows the ring to rock in its groove and "bite" into cylinder walls. RPM DELO Oil checks this wear at the start by an adhering agent which makes it cling to hot cylinder walls.

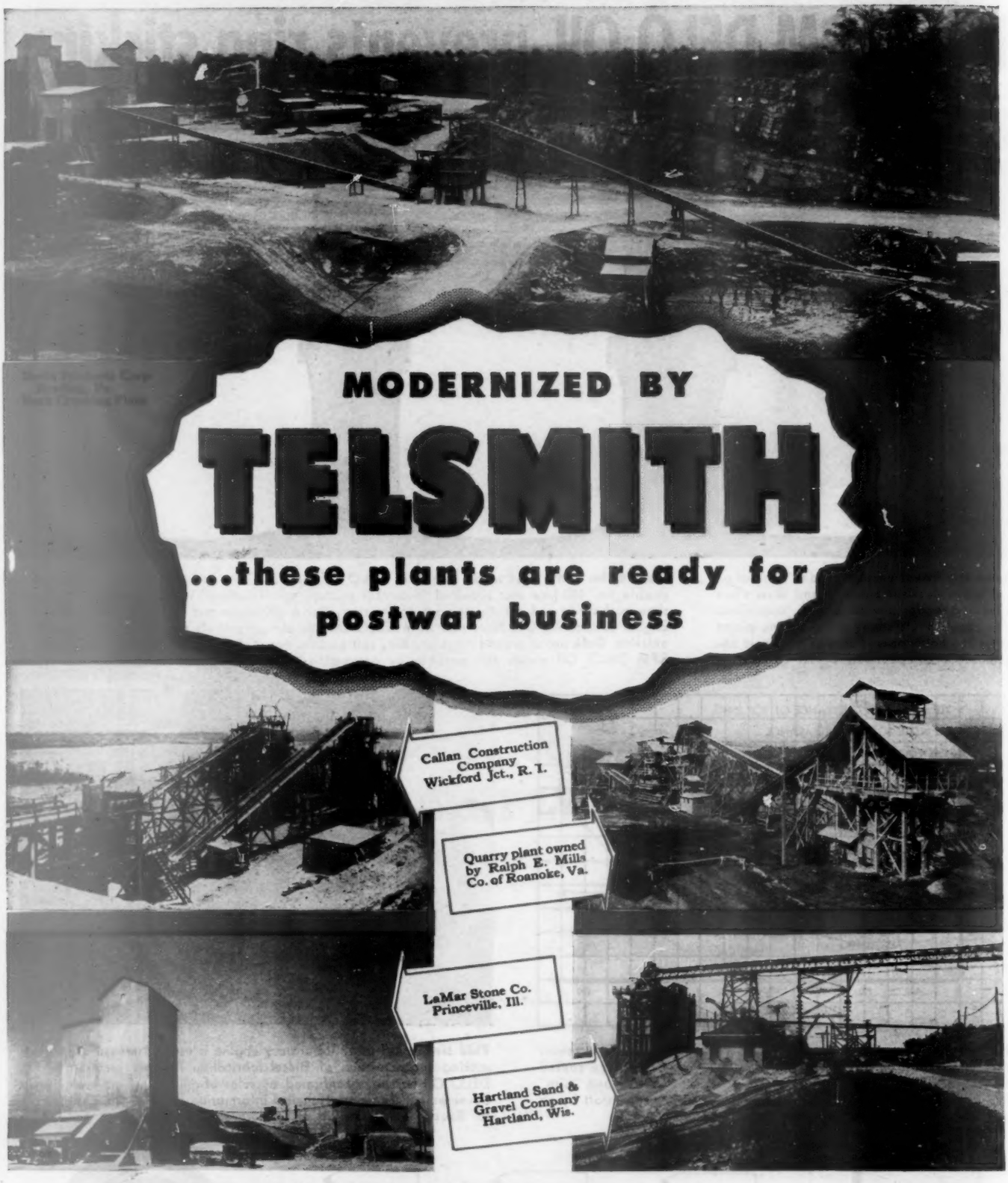


This single cylinder laboratory engine is used to measure the ring-sticking characteristics of Diesel lubricants. The test record of RPM DELO Oil has been confirmed by sales of millions of gallons since its development. For more technical information on RPM DELO Oil, write for Booklet T-7, Standard of California, San Francisco 20, California.

HIGH QUALITY, NATURALLY STABLE BASE OIL
Detergent compound to clean engine.
Anti-oxidant to prevent gum and sludge.
Wear-reducing compound.
RPM DELO
DIESEL ENGINE LUBRICATING OIL

STANDARD OF CALIFORNIA

RPM DELO Oil has world-wide distribution under the names: RPM DELO, Caltex RPM DELO, Kyso RPM DELO, Signal RPM DELO, Imperial RPM DELO, (CONCENTRATE)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TELSMITH
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LaMar Stone Co. Princeville, Ill.
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● The operators of these plants will not be caught unprepared by changed markets, new demands and keener competition in the postwar period. These plants are *Telsmith-modernized!* Re-arrangement, and the right Telsmith equipment for larger capacity and greater flexibility have cut costs and boosted output. Smaller sizes, in the right quantity and quality, can now be produced *profitably!*

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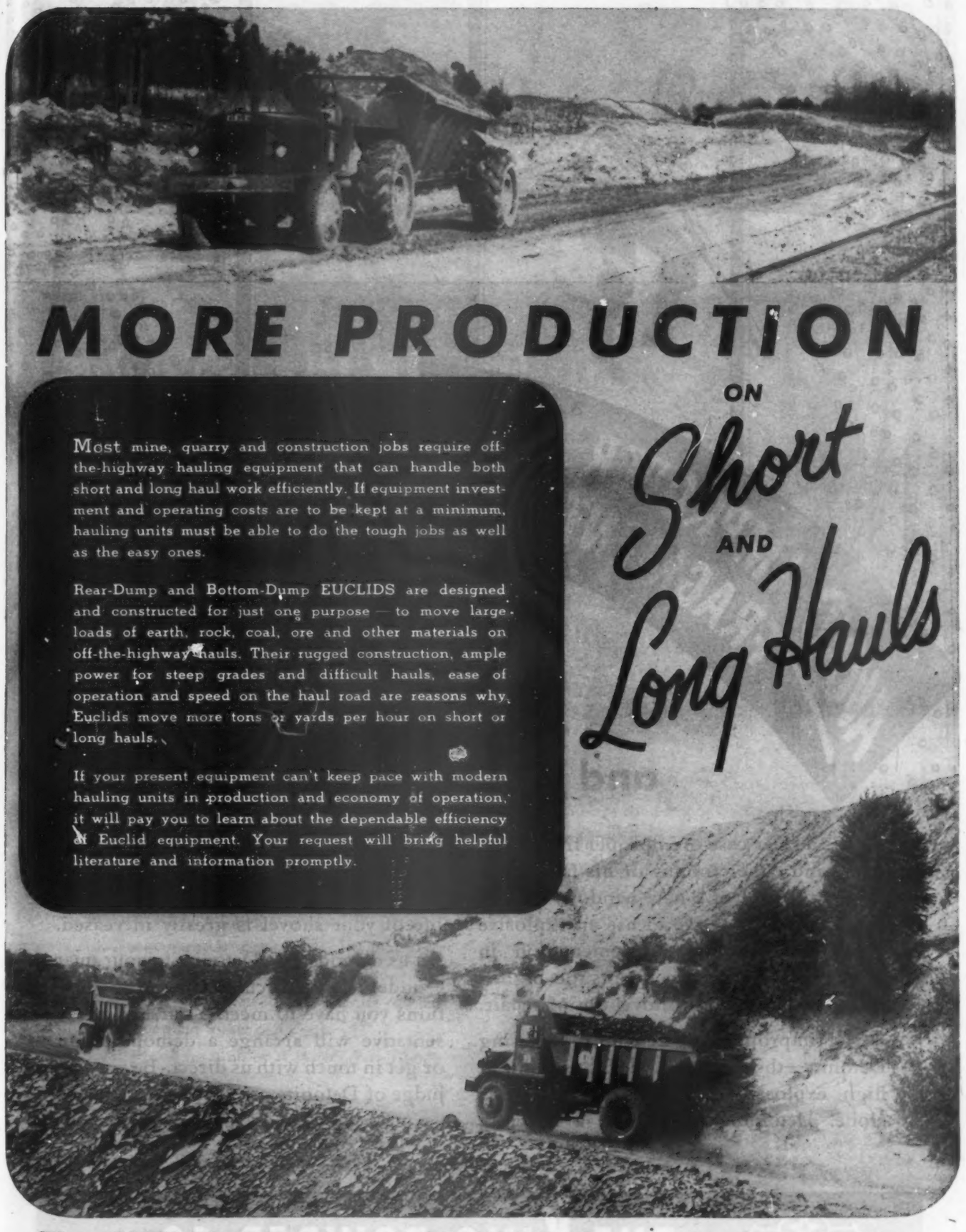

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Most mine, quarry and construction jobs require off-the-highway hauling equipment that can handle both short and long haul work efficiently. If equipment investment and operating costs are to be kept at a minimum, hauling units must be able to do the tough jobs as well as the easy ones.

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HAULING EQUIPMENT
For EARTH ROCK COAL ORE

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. . . WINDOWS COST MONEY and SHOVELS COST MORE!

Here's a clear case of improper fragmentation—and either Johnny or his father will be out the cost of a new window. But it's much more expensive to use an explosive that causes improper fragmentation in mine or quarry. For fragments too big for a shovel may mean a shovel out of repair.

Avoid improper fragmentation by using Detonite—the patented, surface-sensitized high explosive made by King Powder alone. Detonite works with a heaving, shoving, *pushing* action that dislodges the stone in the right sizes. Runs are faster—operation is more continuous—the useful life of your shovel is greatly increased.

Let us demonstrate Detonite in your quarry—under the particular operating conditions you have to meet. Your King representative will arrange a demonstration—or get in touch with us direct. Be your own judge of Detonite results—make your own estimate of what Detonite will save you.

KING EXPLOSIVES

THE KING POWDER CO. INC.
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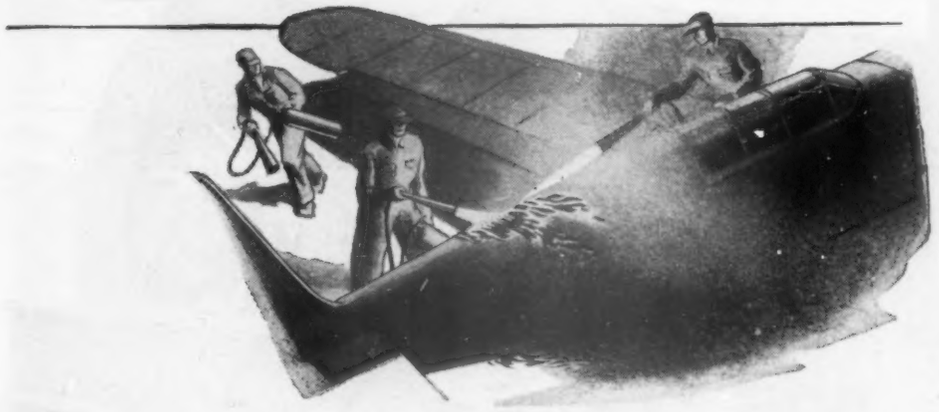
They Needed a Special Kind of Hose

Thermoid Solved the Problem



The General Detroit Corporation, manufacturers of fire extinguishers, asked Thermoid to produce 5/16" wire braid hose, duplicating or improving upon the hose they were then using. Thermoid turned the problem over to its engineering and research staff and they came up with the solution. They engineered a special hose. The tube particularly was designed to handle CO_2 under pressure, with the added feature of being made resistant to the permeating effect of CO_2.

Speaking of this problem, E. A. Warren, Vice-President of The General Detroit Corp., says: "It is simply a grand job of cooperation between Thermoid Company and The General Detroit Corporation, another case where cooperation can make a fine record of necessary goods turned out for the Army and Navy." This problem is one of the many which Thermoid engineers are solving to improve the quality of the products of American industry. If you have a problem concerning the use, design or manufacture of industrial rubber, why not call in the Thermoid field representative.

DON'T PUT IT OFF 'TIL TOMORROW
Buy More War Bonds Today!

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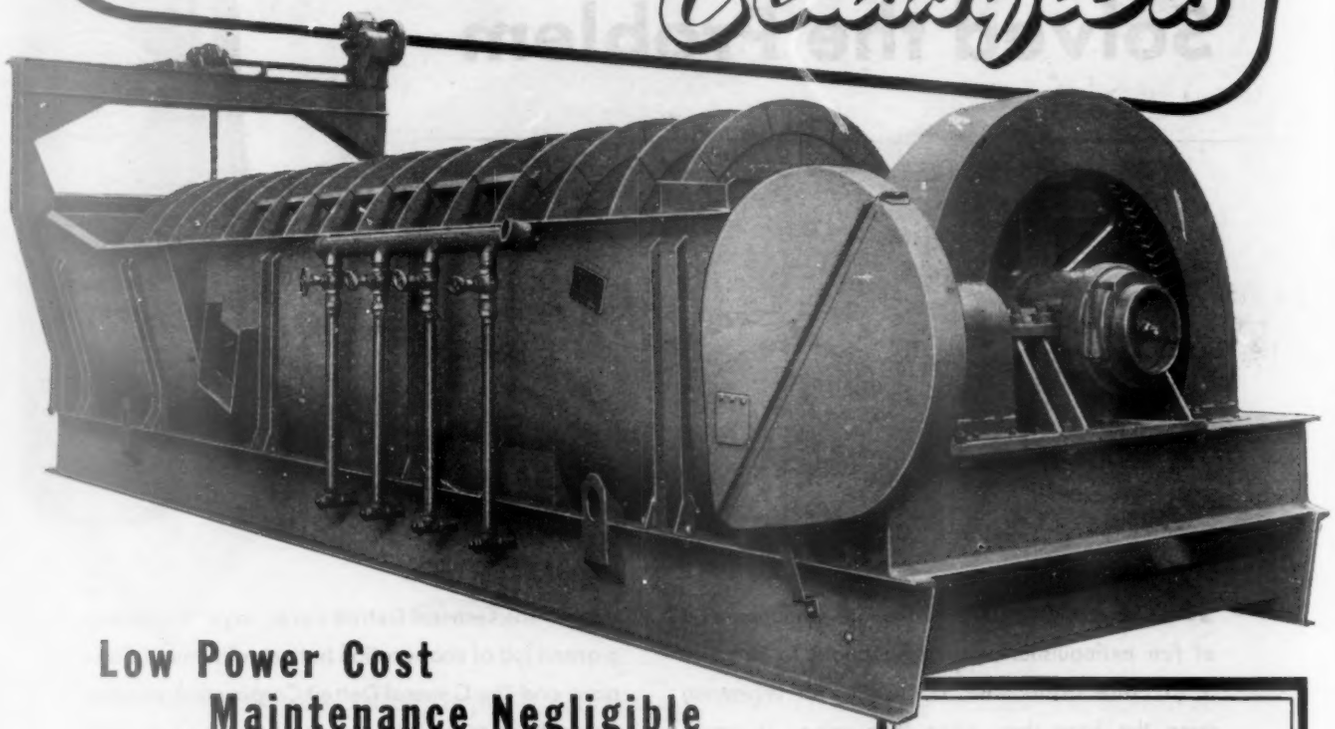
WASH SPECIAL INDUSTRIAL SANDS TO EXACT SPECIFICATIONS

with **AKINS** *Classifiers*



Low Power Cost
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AKINS Classifiers, extensively used thruout the world in straight classification of ores, have been successfully adapted for washing of iron ores and sand. Equipped with wash boxes and lifters on the spirals, as above, these machines are especially desirable for producing sands to exact specifications, as for foundries and glass making.

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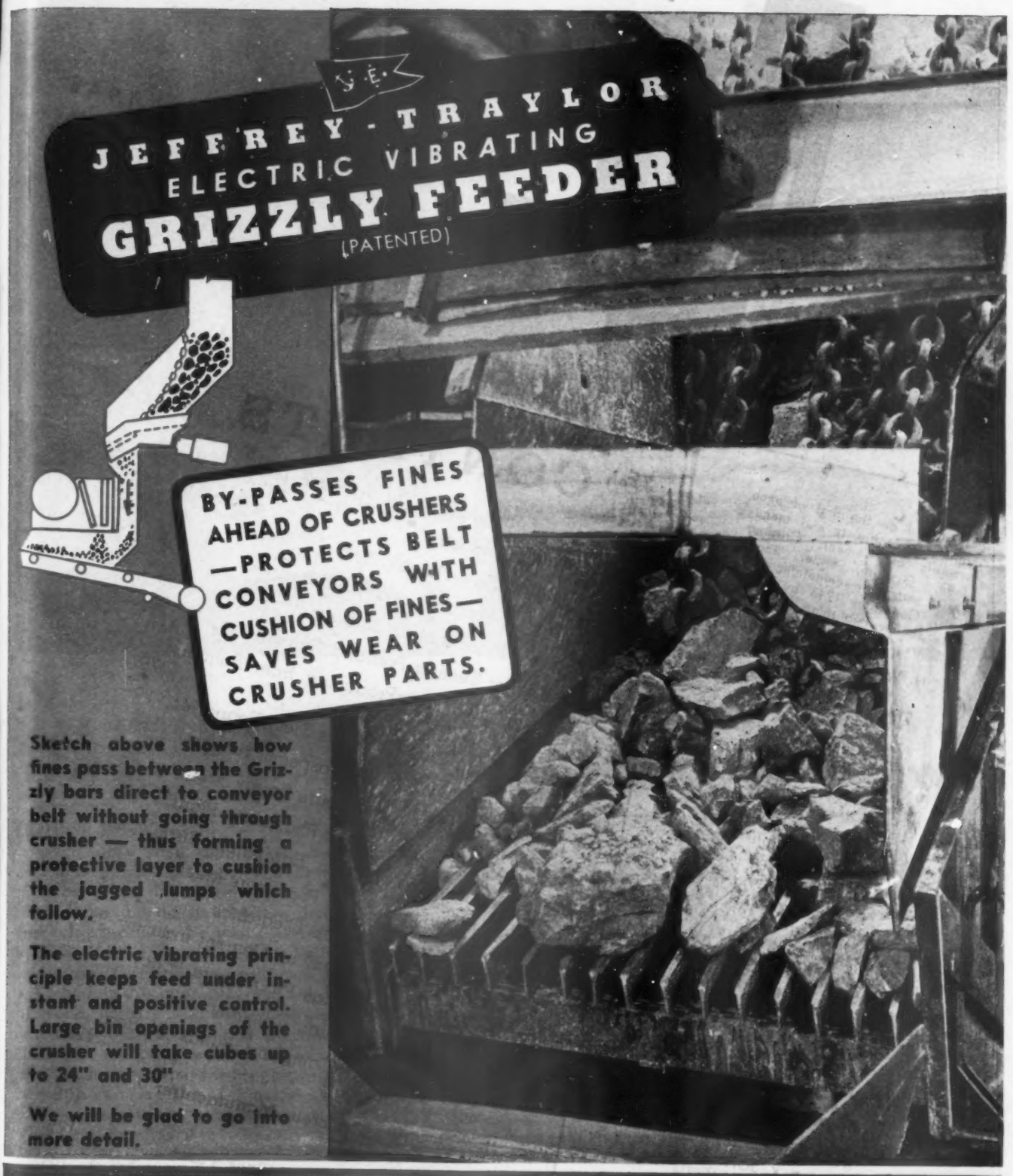
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GRIZZLY FEEDER
(PATENTED)
BY-PASSES FINES AHEAD OF CRUSHERS —PROTECTS BELT CONVEYORS WITH CUSHION OF FINES— SAVES WEAR ON CRUSHER PARTS.

Sketch above shows how fines pass between the Grizzly bars direct to conveyor belt without going through crusher — thus forming a protective layer to cushion the jagged lumps which follow.

The electric vibrating principle keeps feed under instant and positive control. Large bin openings of the crusher will take cubes up to 24" and 30".

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PIT AND QUARRY

JULY, 1945
Vol. 38 No. 1

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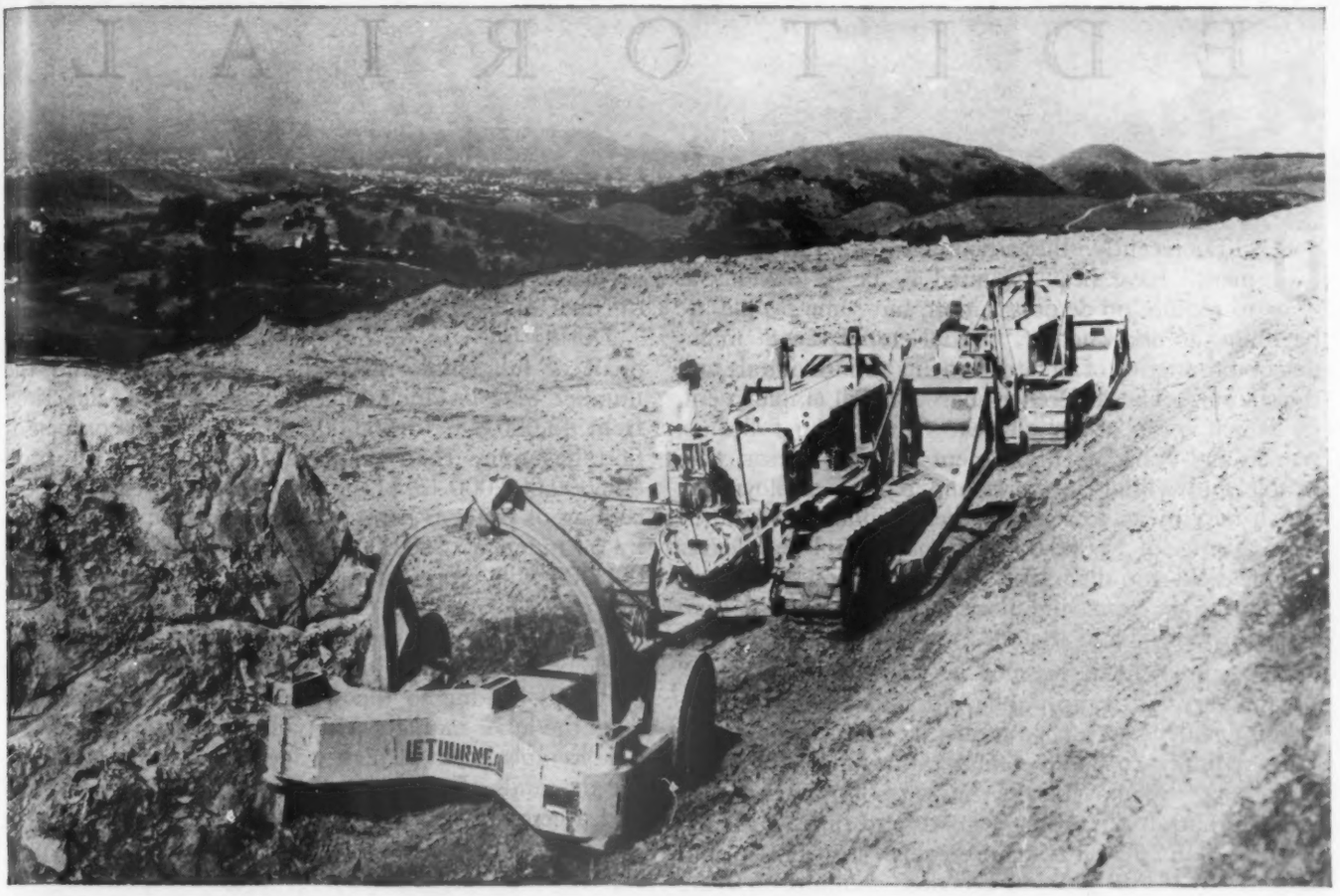

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IMAGINE *fifty* transcontinental highways, or a road running *six times around the earth* at the equator. That will give you an idea of the estimated mileage of roads scheduled to be rebuilt, widened and relocated after the war. *And this is only one item in an estimated $15 billion expenditure for postwar construction!*

To handle this unprecedented volume of work, construction equipment—old and new—must function at maximum efficiency, with minimum maintenance. Effective lubrication is the biggest single factor in assuring this . . . and, on the basis of experience, contractors everywhere use Texaco.

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Texaco Lubrication Engineering Service is available through more than 2300 Texaco distributing plants in the 48 States. Get in touch with the nearest one, or write:

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EDITORIAL

Full Employment in Peace Time

UNTIL recently, the advantages of "full employment" have been assumed to be so obvious as to require no demonstration, but some people are beginning to ask whether "partial employment" might not be productive of greater benefits to individuals and the nation. The differences between full employment, by which some of its advocates mean the full-time, year-in-and-year-out employment of every person who is able and willing to work, and partial employment, which may mean to some of their opponents as much as an average of 15,000,000 persons unemployed, leaves a wide field for discussion and prediction, in which economists are expressing more varieties of opinion than might be expected of them.

Full employment, even if it is only nearly "full," would, it is said, raise public morale by removing the discouragement and frustration that afflict people who can not find steady and remunerative work. It would enable every employable person to obtain a portion of the total output of consumer goods and thus widen the markets of manufacturers, processors, distributors and dealers. It would provide a higher standard of living and a better grounded sense of economic security. It would strengthen the bargaining power of workers by reducing or eliminating the competition that exists between them when jobs are scarce. It would provide the mass purchasing power without which no mass-production industry can operate at full capacity or maximum profit.

Among those who prefer partial employment are some economists who believe that the labor market can not function as well when every employable person is working as when many people are unemployed. Full employment, in their opinion, prevents the application of employees' abilities to the best advantage, because the sense of security it provides deters workers from looking for other jobs in which their skills might be more efficiently utilized. Some of these economists believe that a "reserve" of a few million unemployed workers would be highly desirable. Business men who favor partial employment usually do so on the ground that it makes the labor market "fluid" by providing a large number of applicants for work among whom more satisfactory selection on the basis of merit can be made, that it has a depressing effect on wages by intensifying the competition between men seeking the same job, and that it has a tendency to reduce labor turnover by increasing the worker's fear of losing his job.

Despite these and other differences of opinion on the problem of employment, the great majority of Americans undoubtedly desire full employment or, if that is unattainable, a reasonably high level of employment. But how is either to be achieved? Can private industry unaided provide the jobs needed to prevent serious unemployment? Must the government assume the responsibility of standing by, waiting to put in operation previously devised plans for preventing the consequences of widespread or protracted unemployment?

During the war we have come closer to the attainment of full employment than ever before, and the number of jobs, including military service, has risen from 45,000,000 to 66,000,000. Workers' compensation has more than doubled, having gone up from $48,000,000,000 to $116,000,000,000 a year, but the coming of peace is expected to reduce the latter figure by as much as $30,000,000,000, of which $13,000,000,000 will represent a reduction in, or the discontinuance of, overtime pay. Another large part of the decrease will be caused by the return of upgraded workers to positions of lower status and pay and another part will be due to the withdrawal of some workers from the labor market. Many persons have asked why, if full employment at high wages could be provided by the demands of war, the same degree of employment and a comparable national worker income can not be attained in peace-time civilian industry. They will expect practical programs and tangible results.

•

THE Full-Employment Act of 1945, introduced in the Senate in January, has as its principal objectives the provision of full-time employment for everyone seeking work, a rise in the standard of living, full utilization of our national resources, and the maintenance of the system of private enterprise. Enactment of the bill would make the federal government responsible for following economic policies and programs that will stimulate and encourage the highest feasible level of employment opportunities by private and other non-federal investment and expenditure, and, if continuing full employment can not be achieved by other methods, for the provision of whatever federal investment and expenditure may be required to assure continuing full employment. The President would be required to submit to the Congress a National Production and Employment Budget, estimating the number of persons on the labor market, the expenditures required to provide full employment for them, and the amount of money expected to be spent by private and public agencies. If the last-mentioned type of expenditure should be insufficient to provide full employment, the President would be required to propose legislation that would contribute toward making up the deficiency and propose such additional federal investments and expenditures as might be needed to provide full employment for the potentially unemployed. Because the bill places on the federal government responsibility for providing full employment, the hearings on it will be watched with hope by many who fear the hardships of unemployment and with anxiety by others who fear greater interference by government with the conduct of private business.

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SCHRAMM No. 315 diesel engine driven Compressor, operating three heavy-duty jack hammer type drills.

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This SCHRAMM feature provides safety against dust, grit, and pilfering of parts, and insures continuous performance under all working conditions.

Write for Bulletin AED-44

SCHRAMM INC.

THE COMPRESSOR PEOPLE
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Furthermore, *these oils have been developed without sacrifice in other important characteristics.*

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PIT AND QUARRY

CHICAGO JULY, 1945

Building in Mid-West And East during May Increases Sharply

The F. W. Dodge Corporation has reported that construction activity in the thirty-seven states east of the Rocky Mountains showed sharp gains in May. Contracts awarded in that month called for an outlay of $242,523,000 which was 68 per cent. more than in May of last year. Total contracts for the first five months of this year amounted to $1,255,101,000, a gain of 57 per cent. over the corresponding period of last year. The most significant gain in May was in residential construction, which had trailed last year's volume in each of the preceding four months of the year.

During the first five months of this year, publicly-owned construction contracts accounted for 66 per cent. of the total of all contracts awarded, compared with 75 per cent. in the first five months of 1944.

W.P.B. Gives Nod to Preliminary Road Work

It has been announced that the War Production Board will permit preliminary work on highway and street construction without specific authorization, so long as no lumber or other building materials (except drainage pipe and culverts) are permanently installed.

Florida Concern Loses In Fight against O.P.A.

The Seminole Rock & Sand Company, Miami, Florida, met reverses in its legal fight against an Office of Price Administration ruling when a circuit court of appeals decision favoring the company was ruled out by the Supreme Court. The high tribunal upheld the right of Price Administrator Chester Bowles to insist that a firm's O.P.A. ceiling price be based on actual deliveries during the March, 1942, base period. The Florida company had argued that the basis should be sales ordered but not delivered during that period.

Restrictions on Mining Lifted by Canadian Govt.

According to an announcement released by C. D. Howe, munitions minister of Canada, the restrictions prohibiting development of new mining properties have been lifted. The original ruling, imposed to conserve manpower and machinery, had banned virtually all expansion of existing mines and the installation of new developments after June 22, 1942.

Lone Star, Consolidated Reopen after Shut-downs

Two cement plants in Kansas have recently resumed operations after temporary shut-downs — the Lone Star Cement Corporation mill at Bonner Springs and the Consolidated Cement Corporation plant at Fredonia. The Lone Star employees were notified to return on May 1, and new workers were added to the payroll.

To check on claims of property losses resulting from blasting at the Manegold Stone Company Quarry in Milwaukee, Wisconsin, the operators installed a seismograph and invited city officials to observe the effects of quarry blasting.

The Harbison-Walker Refractories Company of Pittsburgh has acquired a controlling interest in Canadian Refractories, Inc., of Kilmar, Quebec.

Accident Data Given For Lime Industry By Bureau of Mines

According to a recent Bureau of Mines release, the accident-frequency rate among 44 lime plants enrolled in the National Lime Association safety competition for 1944 was 38.513, while the severity rate was 5.527. The disparity between these figures and those given in the National Lime Association report appearing in PIT AND QUARRY for June (pages 75, 76) is partially accounted for by the fact that the data in the June article were based on incomplete tabulations.

While the accident-frequency rate of 1944 was lower than that of 1943, it was the third highest annual rate in the history of the contest, which began in 1935. The 1944 severity rate was higher than in any other year since 1935, except 1940. The loss of skilled workers to the armed forces was given as one cause of the unfavorable record; an increase in labor turnover, longer work days and other similar factors also were mentioned.

Nine of the 44 plants in the competition completed the year (1944) without a lost-time accident. They were the Genoa and Falls Village plants of the United States Gypsum Company, the York plant of the National Gypsum Company, the Martinsburg plant of the North American Cement Corporation, the Asbury plant of the Standard Lime & Stone Company, the Thomasville plant of the J. E. Baker Company, the Thornton plant of the Marblehead Lime Company, the Houston plant of Nyotex Chemicals, Inc., and the Salem plant of the Salem Lime & Stone Company.

The Alpha Portland Cement Company, Ironton, Ohio, has resumed operations after a brief shut-down for repairs.

New Mortar Cements Announced by Firms After Long Research

After years of tests and research on selected raw materials, the Huron Portland Cement Company of Detroit, Michigan, has developed a new mortar cement which officials say will satisfy the most critical users. The producers cite maximum water retention, workability, durability, high strength, permanent bond, high sand-carrying capacity and pleasing color in their new cement.

The Lone Star Cement Corporation also has announced its new product, Lone Star masonry cement, introduced after a long period of intensive research. The new cement is packed in multi-wall paper bags containing 70 pounds net, or one cubic foot.

Airport Program Urged Before House Committee

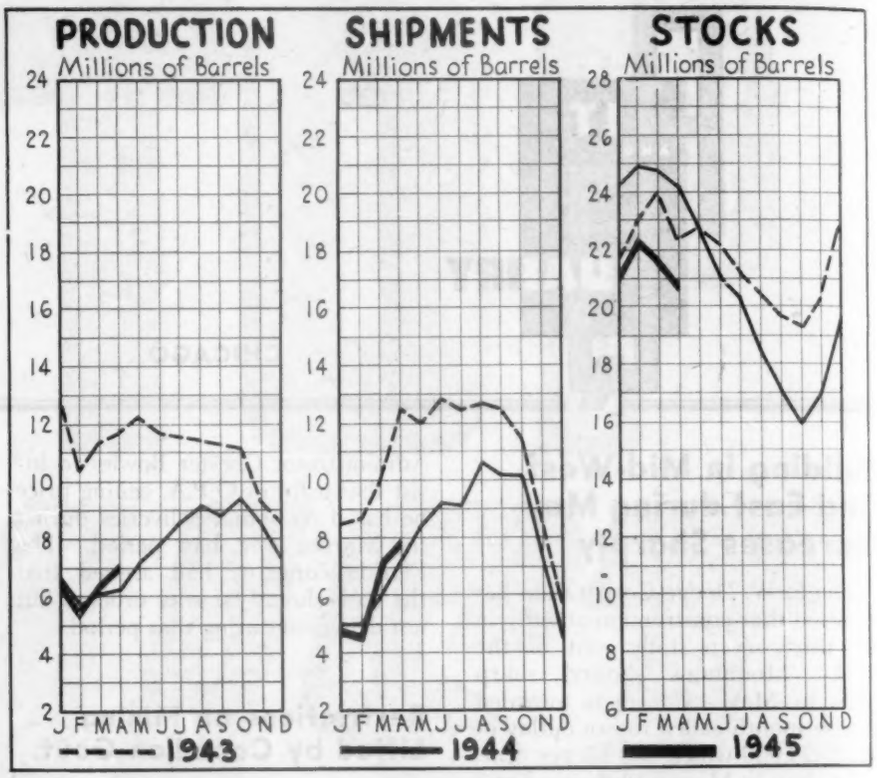
Testifying before the House commerce committee in Washington, D. W. Winkelman, chairman of the Associated General Contractors of America, Inc., urged prompt action and federal aid for the proposed national airport program.

To support his plea, Mr. Winkelman declared that airports require no long preliminary studies, but can be built immediately after the war, if plans are ready. He also stated that no scarce materials would be needed; that Seabees and Army Engineers would supply experienced manpower; and that airport construction would stimuate many other industries, as well as private investment.

A. S. T. M. Handbook Offers Valuable Service

The new 1944 Book of A. S. T. M. Standards, issued in three parts, contains all the society's widely used specifications and tests for materials. Part I deals with metals, Part II with nonmetallic construction materials, and Part III with nonmetallic general materials. An innovation is the inclusion of all emergency standards and emergency alternate provisions which have been used to expedite production and procurement of vital materials. There is also a 200-page index, furnished free to all purchasers of the book or any of its parts. A supplement will be issued for each part late in 1945, in order to keep the publication up to date.

Part II, nonmetallic construction materials, has 447 specifications and tests on such materials as cement, lime, gypsum, brick, structural tile, concrete masonry units, building stone and slate, glass and glass products, and concrete aggregates.

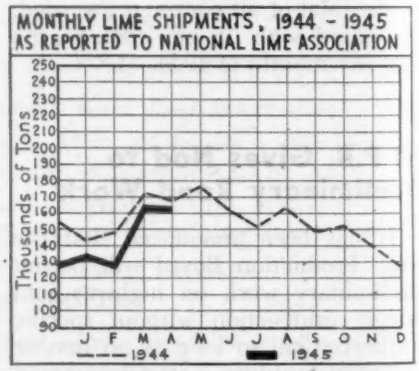


The production of 7,084,000 barrels of finished Portland cement during April reported to the Bureau of Mines, United States Department of the Interior, was 10 per cent. above the output in the corresponding month of 1944. The output advanced 11 per cent. over March, 1945, and follows very closely the trend of the 1935-39 average. Production in April was below demand, and stocks decreased 810,000 barrels from the March, 1945, total. Mill shipments of 7,894,000 barrels were 7 per cent. above the corresponding month of the previous year. Mill stocks of finished cement at the end of April totaled 20,778,000 barrels, a decline of 14 per cent. from the stocks of the corresponding month of 1944.

News Exchange Featured In Company Magazine

A monthly publication of the Consolidated Rock Products Company, Los Angeles, *Consolidated Rock News,* regularly goes to former employees now in various branches of the United States armed services. Much of the space in the 6-page photostat periodical is devoted to letters from soldiers, sailors and marines and items of interest about them.

Operation was resumed at the Lewiston Lime Company, Lewiston, Idaho, after a shut-down during which employees were busy remodeling and modernizing the plant. Last year a new crusher plant was put into operation, and this summer a new hammermill will be set up. Agricultural limestone will thus be added to the previous product, lime rock.



According to data collected by the National Lime Association, 55 companies in April, 1945, shipped 161,340 tons of lime (92,680 quicklime; 68,660 hydrate). Reporting companies represent 43.5 per cent. of the association members' total capacity of record. Based on PIT AND QUARRY'S estimates for the remainder of the industry, the total shipments for the month by all plants were approximately 400,000 tons. Shipments of lime by users for April, 1945, were:

Use	Quicklime (tons)	Hydrate (tons)
Agricultural	4,585	28,614
Building	6,523	15,904
Chemical	81,572	24,142
Total	92,680	68,660

Eastern Geologists Meet at Pittsburgh, Form New Study Group

A regional society "to advance and disseminate geologic knowledge and to provide a forum for geological problems" has been organized at Pittsburgh under the name of the Pittsburgh Geological Society. Details of organization have been worked out at the first five meetings, culminating in a session at which the constitution and the by-laws were adopted.

At the May meeting a symposium on the wartime activity of the United States Geological Survey in the Ohio-West Virginia-Pennsylvania area, particularly concerned with a study of the Berea sandstone, was led by Dr. J. F. Pepper, David F. Demarest and Dr. Gordon Rittenhouse.

Further information concerning the society and its activities may be obtained by addressing W. B. Robinson, Gulf Research and Development Company, Box 2038, Pittsburgh 30, Pennsylvania.

Plan Fluorspar Plant Near Valery Deposit

According to reports from R. T. Hamilton of the Valery fluorspar deposit in Black Canyon, Nevada, near Lovelock, a concentration plant is soon to be built in this area. Mr. Hamilton recently conferred with operators of high-octane gasoline refineries in the Los Angeles area concerning their requirements for hydrofluoric acid, which is manufactured from acid spar.

The Valery deposit is reported to contain the largest supply of high-grade acid spar in the West.

Phosphate, Granules Sales Show Sharp Increases

Reports issued by the Bureau of Mines showed substantial increases in the output of both phosphate rock and roofing granules. During 1944, 5,376,643 long tons of phosphate rock was sold—approximately 250,000 tons above the figure for 1943. Included with tables on production, sales, and prices, were detailed information on the post-war outlook and a review of production in the states where phosphate rock occurs.

The output of roofing granules for 1944 was shown to be 13 per cent. greater than that of 1943. The high total — nearly 1,000,000 tons—was due to the fact that the sales volume of granule-coated asphalt roofing and siding increased greatly, being more dependent upon the maintenance of buildings than upon new construction.

Phosphate Mining Co. Bought by Virginia Firm

The Virginia - Carolina Chemical Corporation of Richmond, Virginia, has announced its purchase of 99½ per cent. of the stock and all outstanding debentures of the Phosphate Mining Company of New York. The phosphate deposits controlled by the Virginia-Carolina interests in Florida will be easily accessible to the facilities of the Phosphate Mining Company at Nichols.

Two employees of the Sunflower Sand Company, Wichita, Kansas, were seriously injured when the tipple of a sand loader on which they were working broke. Both men were hurled 20 feet to the ground.

Over 50 department heads, foremen and superintendents of the Consolidated Rock Products Company of Los Angeles, California, were entertained at a steak dinner recently as guests of the management.

Accident Victim Dies after Cave-in At Fluorspar Mine

Despite the efforts of rescuers at Rosiclare, Illinois, to keep Hester Holloman alive until he could be freed from gravel which had buried him to his neck at the 300-foot level of the Fairview fluorspar mine of the Aluminum Ore Company, the trapped miner died from his injuries. After the accident, a cave-in which occurred on May 21, fellow workmen pumped oxygen into a barrel placed over Holloman's head. He died 30 minutes before they could remove him from the gravel.

Pacific Portland Cement Presents New Product

The Pacific Portland Cement Company introduced its new Hi-Plastic stucco cement recently. According to President J. A. McCarthy, Hi-Plastic was made to fill a demand for a cement which would meet all the requirements for stucco. It is described as having a high degree of plasticity, easy spreading and high sand-carrying qualities, a fine texture and uniform color. Hi-Plastic was developed at the company's research laboratories at Redwood City, California.

When their dredge cannot be floated within range of the deposit, the operators of the McGrath Sand & Gravel Company's plant at Pekin, Illinois, employ a bulldozer for feeding pit-run sand and gravel to the pump. The company reports that this method of operating has effected a cost reduction of about 30 per cent. as compared with the former practice of handling the material with shovel and trucks. The bulldozer is mounted on a Caterpillar D8 Diesel tractor. Meckum Engineering, Inc., supplied the 10-inch dredge pump.

Progress Reported on Inter-American Link Over Rough Terrain

In a recent report the Public Roads Administration disclosed that considerable progress was made during 1944 on the Inter-American highway.[1] In Mexico, a new section, from Mexico City to Oaxaca, was officially opened early in 1944, and later a second piece, from Oaxaca to El Portillo.

The work in Guatemala, where United States Army engineers have collaborated with natives, was done chiefly on an alternate road between Tapachula and Guatemala City. This road, at a lower elevation than the line of the Inter-American highway, will probably be used chiefly by trucks and some buses. American Army engineers also are at work in El Salvador, where with Salvadorean road men they have improved the highway to such an extent that it is now possible to drive across the state in all kinds of weather.

Some of the most difficult highway construction ever attempted has been in progress in Costa Rica, where the line traverses extremely mountainous country. Honduras, Nicaragua, and Panama also reported considerable progress on the all-American link.

Marquette Cement Mfg. Co. Re-elects Officials

At the annual directors' meeting of the Marquette Cement Manufacturing Company, held in Chicago on May 1, Stuart Duncan of La Salle, Illinois, was re-elected chairman of the board. Officers re-elected at the meeting were as follows: president, W. A. Wecker; vice-presidents, W. W. Dickinson and D. S. Colburn; secretary-treasurer, V. J. Hanley.

During the meeting, recognition was given Robert Kenny, general shift foreman, who retired after 38 years of continuous service at the Oglesby, Illinois, plant.

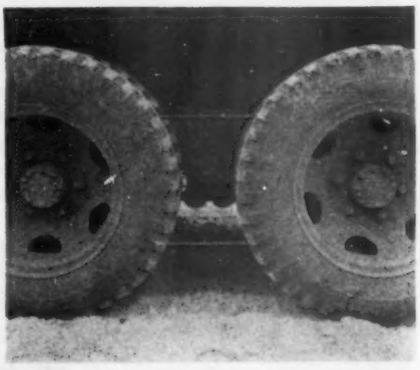
Lubricants Identified By Color-Matching Plan

At the request of the War Production Board and the National Machine Tool Builders Association, the American Standards Association has developed a simple system of matching colors to guide unskilled labor in applying the proper lubricants to machinery. The device not only facilitates the lubrication service, but also reduces damage to machinery in war plants.

Seabees' Invention Saves Time and Tires

Seabees working in coral pits on Pacific islands have solved a troublesome problem of truck tire failure by using a short length of cable and a little Yankee ingenuity. Coral rocks about the size of a doubled fist had a tendency to work up between the dual tires on dump trucks. Once a rock worked in, the constant flexing of tires on the highway developed bad sidewall bruises which ruined tires beyond repair. Work was being pushed so rapidly that a truck driver had no time to get out and look after his dual wheels every few minutes.

A Seabee finally hit upon the idea of removing one wheel and installing a joined length of wire rope



Length of wire rope serves as a wiper to remove rocks lodged between tires.

securely between the tires. When the wheel was put back, the cable served as a stationary wiper to catch all rocks as they lodged between tires, making it impossible for a rock to remain for more than one revolution.

Texans Guard Against Motor Tax Diversion

Approved by the Texas legislature before adjournment was a state constitutional amendment giving automotive tax receipts partial protection against diversion to uses other than highway maintenance and construction. The proposed amendment would send three-fourths of all net income from license fees and gasoline taxes into a fund for enlarging and maintaining the state's highway system.

Cement Consumption Estimates Increased After Nazis Collapse

Figures released by the War Production Board in April for estimated Portland cement consumption in 1945 have been revised in the light of recent military developments. The April data, based upon the assumption that the two-front war would be prolonged throughout 1945, placed the total consumption at 89,400,000 barrels.

With the capitulation of Germany, the 1945 consumption (estimated) has been increased to 102,690,000 barrels, of which approximately 94,620,000 have been assigned to domestic requirements.

Permanente Contracts Fill Huge Govt. Needs

From the beginning of the present war until March 1, 1944, the Permanente Cement Company supplied all the cement for United States Navy works in the Pacific islands and large quantities for use in many Army and Navy projects within the continental boundaries of this country. The count at that time totaled contracts amounting to $22,406,000.

Since then, plant production has kept pace with demands for construction overseas and at home.

Mineral Resources Of Missouri Charted

The publication of a five-color mineral resources map of Missouri has been announced by Dr. Edward L. Clark, State geologist and director of the Missouri geological survey and water resources at Rolla. The map is on a scale of approximately 10 miles to the inch and shows general distribution of 21 different mineral resources. All principal processing plants and many mines, quarries, pits, oil and gas fields, oil and gas lines and railroads are shown. Copies of the map may be obtained from the Missouri Geological Survey, Rolla, Missouri.

The Willingham-Little Stone Company, Atlanta, Georgia, has announced that it will soon begin operations in its new plant at Whitestone, now in process of construction. The building site is one mile north of the company's "upper" plant, where a new dolomite deposit is being opened.

[1] See "Modern Highway to Panama Canal, Progressing Despite Rough Terrain," PIT AND QUARRY, April, 1944, page 65.—ED.

Post-war Planning For Better Roads Started by 7 States

Several states have announced forward-looking plans for highway and road improvements, among them Texas, Kansas, Michigan and Louisiana. The Texas Highway Commission's program calls for a $60,000,000 farm - to - market road construction project for the first three post-war years. It includes paving 5,830 miles of highways in rural areas and maintenance of 1,375 miles already designated to be built as highways.

Kansas plans to spend twice as much in 1945 as it did last year, according to the state highway commissioner, L. L. Marsh. If adequate manpower and equipment can be obtained, the commission plans to repair damage to roads and to reconstruct 4,506 miles of highway at a cost of over $4,000,000.

Michigan has a $233,000,000 post-war highway construction program lined up, with $50,000,000 promised by the recently-enacted federal aid bill during the first three post-war years. Louisiana's department of highways estimates that the state will spend approximately $18,000,000 for road construction, maintenance and operation during 1945.

Missouri's present revenue sources are expected to be sufficient to match the $43,000,000 of federal-aid funds which will be available to the state in the first three post-war years, according to estimates of the State Highway Commission as announced by Chief Engineer Carl W. Brown.

The state expects to have about $14,500,000 in its road fund at the end of this year to start matching federal aid. This will permit an immediate start on construction as soon as labor, materials, contractors and equipment are available.

The issuance of $12,000,000 in highway debentures to finance the state's share of a $46,000,000 highway construction program was overwhelmingly approved by Montana voters who marked their ballots "Yes" at a referendum on June 5. The proposed plans include work delayed by the war, as well as new projects scheduled for completion within three years after the cessation of hostilities.

Washington's state director of highways, Clarence Hickey, recently suggested that since the state has only $40,000,000 available for carrying out post-war highway projects, it might be advisable for Washington to borrow money to launch an extensive highway construction program. It has been estimated that proposed work on the state's highways will cost $175,000,000.

Five Kaiser Divisions To Get New Headquarters

Bids were opened by Arthur Dresser, manager of the Glacier Sand & Gravel Company of Seattle, for the construction of a new building which will house the Puget Sound headquarters of five divisions of the Henry J. Kaiser interests. Other offices to be located in the new building are those of the Permanente Cement Corporation, Permanente Metals Corporation, Kaiser, Inc. (iron and steel department), and Standard Gypsum Company. Construction will begin as soon as priorities have been granted.

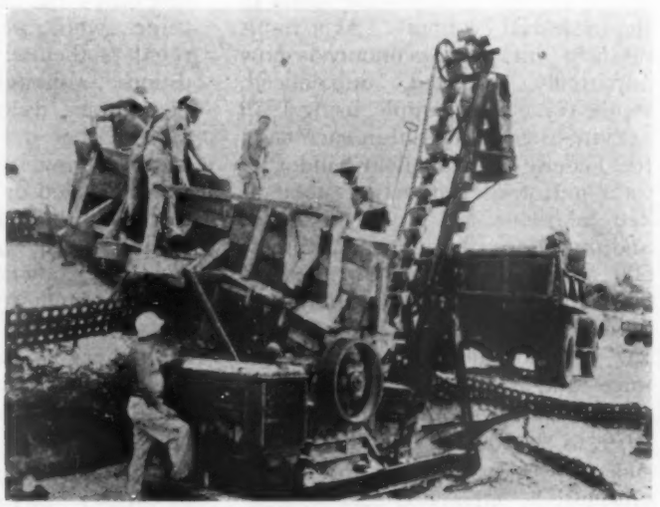
Calaveras Cement Co. Buys 360-Foot Kiln From Manganese Plant

The Calaveras Cement Company plant at Kentucky House, near San Andreas, California, has purchased from the Defense Plant Corporation the 11-foot 3-inch by 360-foot kiln which had been used by the Manganese Ore Company at Henderson, Nevada. The dismantled kiln is to be shipped to Kentucky House, where it will displace one of the 11-foot 3-inch by 240-foot kilns now in operation.

Canadian Good Roads Assn. Meets in Toronto

About 500 delegates and guests attended the fifty-first annual meeting of the Ontario Good Roads Association at Toronto. A review of the present status of highway work in Ontario was given and post-war plans of the Ontario Department of Highways were outlined by Minister G. H. Doucett. William Keith, Wellington County, was elected president, and W. S. McKay, Elgin County, first vice-president.

Mineral wool production in 1944, according to the Bureau of Mines, reached 568,296 short tons, valued at $54,482,796, an increase of $10,812,086 in value and 16,772 tons in quantity over the total for 1943. The fact that the greatest advance occurred in the industrial field is attributed to the increased requirements of the armed forces for mineral wool insulation products on ships, aircraft, tanks, and similar equipment.



These two U. S. Navy photographs afford action glimpses of the Seabees in some of the construction work that has brought them world renown and unanimous tribute from the troops whose path of victory is made easier by this great bunch of men. Left: A Northwest shovel digging away in a stone quarry with tractor and bulldozer cleaning up on Vunda Point in the Pacific. Right: The Seabees busily occupied crushing rock for one of the various building jobs that must be done on every island as it is captured by American troops.

WASHINGTON NEWS LETTER

another P&Q exclusive

WITH the nation well into the period of partial demobilization — to be made complete after the defeat of Japan — it is disturbing to note from recent events that government reconversion policy is still unsettled. In an unprecedented move last month, W.P.B. Chairman Krug released to the public a full-dress reconversion report, ostensibly addressed to the members of the board. This revealing document, which has caused much confusion in labor and industry circles, deals with the basic problem of how much and what kind of government control should be in effect during the demobilization period. This question is different from, although obviously allied to, the much broader problem of the permanent role of the government in economic affairs.

According to Mr. Krug, controls should not be used for purposes for which they were not intended; therefore, as in the past, only those controls necessary to the prosecution of the war, *i.e.*, the achievement of munitions schedules, should be imposed. This means that no action or policy should be based upon long-run considerations of the civilian economy as such. During the war, of course, an elaborate structure of government regulation of the production and distribution of the resources of the nation has been evolved for the purpose of converting the nation from a civilian to a war-time basis. This has been accompanied by, and in fact was designed to effect, large-scale shifts in the industrial economy. As a result of these shifts, the economy is now admittedly distorted, unbalanced, top-heavy. For example, using 1939 activity as equal to 100 in each case, the Federal Reserve Board index of total industrial production stood at 216 in 1944; for producers goods and munitions, the index was almost 600, while for consumers goods it was 120. The index of durable goods production stood at 324 as against 157 for non-durables. The labor force and the armed services increased from about 54,000,000 in 1939 to 74,000,000 in 1944, while average weekly hours of work were substantially advanced and striking gains were made in the productivity of labor. Factory employment went up 67 per cent., while factory pay rolls increased 234 per cent. Plant utilization and the expansion of facilities have been unparallelled in history. During the 5-year period, 1940 to 1944, the additions to manufacturing facilities totaled about 50 per cent. of the replacement value of the nation's plant in 1939; more than twice as much machinery and equipment was produced in this period as in the ten years 1929 to 1938. In the meantime, residential building has fallen to one-fourth of the pre-war level. Government war spending, which is now to decline substantially, has been the prime mover of economic activity, with military outlays of $86,000,000,000 accounting for more than 40 per cent. of the gross national product (total goods and sevices produced) in 1944, as against a negligible amount before the war. Meanwhile, consumer expenditures have increased by half since 1929 in absolute dollar terms, but have declined from 75 per cent. of the total product in that year to less than 50 per cent. in 1944.

How far-reaching is the responsibility of the government to smooth the transition of the economy back to internal balance and a high level of activity, and what are the proper limits to government direction in this sphere? Mr. Krug evades this question, preferring to place his faith and his hopes for successful reconversion in the large pent-up demand for civilian goods both at home and abroad. The *basic danger* from Mr. Krug's standpoint is "that we will overlook the natural resilience of the economy—the capacity of manufacturers, wholesalers, and retailers to re-adapt themselves to changed conditions", although he recognizes that "temporary dislocations" are inevitable. Other dangers, which are probably much more serious, are either ignored or dismissed as administratively difficult. For example, referring to the use of W.P.B. controls, the statement is made that it would be undesirable for the government to attempt to determine "Whether a particular allocation of materials would contribute to greater re-employment than some other allocation; or whether a particular allocation would contribute to greater stablization of the price structure."

The naivete of relying exclusively upon the natural resilience of the economy to prevent inflation, deflation or unemployment during a period of great economic stress and strain has led at least one journal to refer to Mr. Krug as "the modern Adam Smith". Certainly, the economic history of the period following the last war, when the problems were not nearly as difficult, is not on Mr. Krug's side. The precise significance of his statement is a little obscure, but it was probably inspired by an excessive preoccupation with the legal aspects of his own agency's use of war-time powers. Actually, the position enunciated by Mr. Krug is untenable; it will delay the final clarification of policy but it can not prevail. It is recognized by the Administration, and especially by the President, that abandonment of controls at this stage would be disastrous for all sectors of the economy. Apparently, Mr. Truman has a much sounder if less legalistic appreciation of the inseparability of conversion and reconversion problems, and of the economic needs of the nation, than some of his subordinates. In his recent message to the Congress requesting expanded unemployment benefits—delivered on the same day that Mr. Krug's statement appeared—the President said:

"The transition from war to peace is part and parcel of the war and we can not shirk our obligation to those temporarily unemployed through no fault of their own . . . Decent unemployment benefits would serve as a bulwark against post-war deflation . . . (and) will help materially to prevent a sharp decline in consumer expenditures which might otherwise result in a downward spiral of consumption and production."

Anti-inflation control holds a cardinal position on the President's economic program. It should be evident, particularly in view of the generally successful war-time experience, that all the government's powers including those of the W.P.B., will be used to the full extent necessary to prevent a runaway spiral. In addition, Mr. Truman, through O.W.-M.R. Director Vinson, has endorsed the "full employment" bill which provides for government planning of national expenditure and investment programs. It goes without saying that the difficulties of achieving full employment in the post-war period would be seriously complicated if we failed to minimize unemployment during the transition.

the VICTORY *Program*

. . . . . AND YOUR BUSINESS

AUTOMOTIVE REPLACEMENT PARTS.—All restrictions on the production and distribution of automotive replacement parts have been removed by a revision of Limitation Order L-158, announced by the War Production Board on May 21. The action taken is in accord with the recommendations for post-V-E Day made by the Replacements Parts Industry Advisory Committee at its last meeting in Washington, August 24, 1944. The W.P.B. said that it was generally agreed, however, that the production of certain automotive replacement parts should be protected by firm allotments of controlled materials and by the preference ratings assigned to essential civilian production, so the order has not been revoked in its entirety. In the new revisions all the aids given the parts industry in the past are retained but are confined to the defined list of items appearing in Schedules I and II.

CEILING PRICES.—By its decision in the case of *Chester Bowles, Administrator, Office of Price Administration, Petitioner, v. Seminole Rock & Sand Company,* the United States Supreme Court on June 4, 1945, upheld the contention of the O.P.A. that a producer is not permitted to charge for his material — in this case crushed stone — a price higher than the highest price he charged for the same material *delivered* in March, 1942, even though he may, as in this case, have charged a much higher price for the same material sold for delivery in a later month. The case came up from a Federal District Court and a Circuit Court of Appeals which had upheld the argument of the Seminole company that its "highest price charged in March, 1942" was a contract price of $1.50 per ton for delivery after March. The O.P.A. insisted that the company's ceiling price was 60 cents per ton, which was the price at which crushed stone was actually delivered in March, 1942, under an agreement between the seller and a railroad made in October, 1941.

CONVEYING MACHINERY.—On June 6 the War Production Board revoked its General Limitation Order L-193, which restricted the materials used in the manufacture of conveying and power-transmission equipment. This does not mean, however, that equipment of these types will soon become available, because the manufacture and delivery of such machinery remain subject to all other applicable W.P.B. orders and regulations.

LIME PRICES INCREASED.—Producers of all building, chemical and industrial lime, except agricultural lime, produced in Arkansas, Kansas, Nebraska, Oklahoma and the western half of Missouri have been granted an increase of 75 cents per net ton in their f.o.b. ceiling prices, according to an announcement made by the Office of Price Administration on June 20. Effective June 21, the increase is designed to compensate lime-manufacturing plants for increases in their production costs, particularly fuel and labor costs, which have occurred since March, 1942. In the states named, March, 1942, (ceiling) prices ranged from $7 to $10 per net ton f.o.b. plant, and these may now be increased 75 cents.

L-192 CONTROLS EASED.—Limitation Order L-192 dealing with construction machinery was completely revised by the War Production Board on May 17. The new order, reprinted in full below, eliminates production scheduling, and substitutes List 1, with 14 items, for the former Schedules A and B, which contained 98 items that were under production and distribution control.

The principal provisions of the amended order are:

Up to 75 per cent. of each producer's monthly output of each model of the items covered by the order is reserved for the military. No distribution control is imposed on the remainder of his monthly production of such items, and they may be sold without restriction. For items on List 2, however, specific W.P.B. authorization is required for the sale of the remainder of the producer's monthly output, and must be applied for on Form W.P.B. 1319, which must be filed with the nearest W.P.B. field office.

If less than 75 per cent. of the production of a particular item is required by the military agencies during any month, the portion not required may be shipped to other persons, within the provisions controlling the sale of items on List 2.

Repair parts are also apportioned. When a producer's unfilled orders for a particular part exceed his inventory of that part, he is required to reserve up to 75 per cent. of his total deliveries of the part for the military. When this condition no longer exists with respect to a particular part, this restriction on delivery is lifted.

The full text of the order follows:

PART 1157—CONSTRUCTION MACHINERY
[Limitation Order L-192, as Amended May 17, 1945]

Section 1157.10 *Limitation Order L-192* is hereby amended to read as follows:

The fulfillment of requirements for the defense of the United States has created a shortage in the supply of certain items of construction machinery and repair parts for defense, for private account and for export; and the following order is deemed necessary and appropriate in the public interest and to promote the national defense:

§ 1157.10 *Limitation Order L-192*—(a) *What this order does.* This order states the rules on deliveries of those construction machinery items and repair parts which are expected to continue in short supply after the defeat of Germany. The items covered are those on Lists 1 and 2 (including track-laying tractors formerly under Order L-53). In general, the order reserves for military agencies up to 75% of each producer's monthly output of each model of these construction machinery items; the remaining 25% plus any quantities not needed by those agencies may be sold to other persons without restriction if on List 1, but only upon specific authorization of the War Production Board if on List 2. Critical repair parts are apportioned on a similar, but not monthly, basis.

(b) *Definitions.* For the purpose of this order:

(1) "Producer" means any person engaged in the manufacture of construction machinery or repair parts.

(2) "New construction machinery" means any item listed on Lists 1 and 2 to this order which has never been delivered to and put into regular use by a person acquiring it for use. It does not include any surplus construction machinery which has been purchased from a disposal agency of the United States Government.

(3) "Model" means any one size or type of construction machinery which is identified by the producer with a separate model number or size designation.

(4) "Repair part" means any part manufactured or sold by a producer for use in the repair and maintenance of construction machinery. It does not include components or attachments which change the functional operations of the machinery as originally shipped.

(5) "Military agency" means the Army, Navy, Maritime Commission, War Shipping Administration and Veterans' Administration.

(c) *Procedure for placing and receiving orders for List 2 construction machinery.* No person shall sell or deliver any new construction machinery listed in List 2 except to a military agency, unless the purchase or delivery order is accompanied by authorization on Form WPB-1319 or by a certification as explained below. Application for such authorization and for a preference rating must be made by filing the required number of copies of Form WPB-1319 with the nearest War Production Board field office in accordance with the current instructions for the form. When a person receives authorization on Form WPB-1319 to purchase List 2 construction machinery he may give his supplier the authorization along with his purchase order, or, if he prefers, he may give the supplier a certification in substantially the following form: "Authorized under Order L-192 on Form WPB-1319, Case No. ———." This certification shall constitute a representation to the War Production Board that the purchase or delivery of the List 2 construction machinery ordered has been specifically authorized by the War Production Board on Form WPB-1319.

(d) *Restrictions on deliveries*—(1) *New construction machinery.* If required by orders from military agencies, a producer must deliver to those agencies in any calendar month up to 75% of his total deliveries of each model of new construction machinery during that month. This means that he may deliver to persons other than military agencies at least 25% of his total monthly deliveries of any model, and more than 25% to the extent that deliveries of the particular model directly to military agencies are not required during the month. The producer may also deliver more than 75% of any model to military agencies during the month, but need not do so unless a greater percentage is required by the terms of any purchase contract entered into between himself and military agencies before May 17, 1945.

(2) *Repair parts.* The rule on apportioning of repair parts is somewhat different and applies only when unfilled orders in a producer's hands calling for immediate delivery of a particular repair part exceed his inventory of that part. As long as that condition exists for any repair part, the producer may not deliver more than 75% of his total deliveries of that part to military agencies if there are unshipped orders for the part on hand from other persons, and may not deliver more than 25% of his total deliveries of that part to other persons if there are unshipped orders on hand from military agencies.

(3) *Special directives.* The War Production Board may direct any producer in writing to deliver a greater proportion of his deliveries of any model or repair part than above specified to either military agencies or persons other than military agencies.

(e) *Reports.* On or before the 15th day of each month, every producer must file on Form WPB-1689 in accordance with the instructions on the form, a statement of his production and shipments of new construction machinery for the previous month and a statement of his unfilled orders as of the last day of that month.

(f) *Applicability of regulations.* This order and all transactions affected by it are subject to all applicable regulations of the War Production Board, as amended from time to time, unless the order states otherwise.

(g) *Violations.* Any person who wilfully violates any provision of this order, or who, in connection with this order, wilfully conceals a material fact or furnishes false information to any department or agency of the United States is guilty of a crime, and upon conviction may be punished by fine or imprisonment. In addition, any such person may be prohibited from making or obtaining further deliveries of, or from processing or using material under priority control and may be deprived of priorities assistance.

(h) *Appeals.* Any appeal from the provision of this order shall be made by filing a letter in triplicate referring to the particular provision appealed from and stating fully the grounds of the appeal. This letter should be filed with the field office of the War Production Board in the district in which is located the plant or branch to which the appeal relates.

(i) *Communications.* All communications concerning the order should, unless otherwise directed, be addressed to the War Production Board, Construction Machinery Division, Washington 25, D. C., Ref: Order L-192.

Issued this 17th day of May 1945.

WAR PRODUCTION BOARD,
By J. JOSEPH WHELAN,
Recording Secretary.

List 1

Angledozers, bulldozers and modifications thereof.
Cranes, attachments for tractor mounting.
Crushing plants, portable type.
Ditchers, ladder and wheel types.
Distributors, bituminous.
Finishers, paving, bituminous.
Loaders, portable bucket (other than drag, flight or scraper type coal conveyors).
Plants, asphalt, including travel mix type.
Power control units, attachments for tractor mounting (both cable and hydraulic).
Pumps (portable engine or electric-motor-driven pumping units, mounted on skids, with or without handles, or trailer mounted): self-priming centrifugal pumps, horizontal or vertical triplex piston road pumps, ordinarily used for contractor's purposes or by contractors for dewatering and supply.
Rollers, road, portable, tandem and three-wheeled types.
Scrapers, carrying and hauling, self-propelled.
Shovels, attachments for tractor mounting.
Winches, attachments for tractor mounting.

List 2

Cranes, crawler and rubber-tired mounted power and modifications thereof, except freight handling lift trucks.
Draglines, walking type (other types—see Cranes).
Graders, self-propelled, earth moving type.
Shovels, crawler and rubber-tired mounted power, and modifications thereof.
Tractors, tracklaying type.

TRUCKS AND TRAILERS.—During May, 1945, 29,242 vehicles were released by the War Production Board under its truck-rationing program. Of this number, civilian users received 4,699 light trucks, 13,328 medium trucks, 3,157 heavy trucks and 2,302 trailers. The total of 29,242 represents a considerable increase over the number released in April, when only 21,996 vehicles were made available.

TRUCK PRODUCTION FOR 1945.—Motor-truck production quotas totaling 233,472 machines for 1945 have been allocated to the manufacturers. Of this total, 40,000 will be light trucks, 144,181 will be medium trucks, 37,444 will be light-heavy machines, 10,417 will be heavy-heavy units, and 1,430 will be off-the-highway vehicles. The production of 188,700 additional trucks during the second half of 1945 has been authorized, but the company quotas have not yet been assigned.

TRUCK TIRE SIZES.—On all certificates for large truck tires issued after June 5, 1945, and on all those for small truck tires issued after June 11, specific tire sizes will be indicated, according to an announcement made by the Office of Price Administration on June 5. The new requirement will enable the O.P.A. to direct the issuance of the various sizes of truck tires in closer conformity with their production and supply. If a truck owner's truck-tire certificate calls for a single size of tire, dealers may deliver only tires of the exact size designated. A single certificate may be issued for several tires only if all the tires covered by it are of the same size.

Heretofore, many truck-tire certificates have been issued in two quota size groups —"8.25 or larger" or "7.50 or smaller"— and this allowed truck owners to buy any size of truck tire within the size group for which the certificates were written.

Dealers are allowed to replenish their stocks with truck tires of the size they need within those two groups to replace those sold in exchange for certificates.

All applications for tire certificates must still be made to local War Price and Rationing Boards, who will forward those for tire sizes "8.25 or larger" to the Emergency Truck Tire Boards for processing. However, the exact truck tire sizes needed must be furnished with each tire application filed in the future.

TRUCK-TIRE SUPPLY.—In spite of some improvement in the availability of small sized truck tires, heavy-duty truck tires will continue to be in tight supply in the third quarter of 1945, according to a statement made by Colonel J. Monroe Johnson, director of the Office of Defense Transportation, on June 10. The O.D.T., which is the claimant agency for civilian transportation, requested 2,633,000 truck and bus tires for replacement purposes in the third quarter, this total including the deficiencies accumulated during the first two quarters. Only about 71 per cent. of this number, or 1,863,155, has been allocated by the War Production Board, which makes the total deficiencies for the first three quarters of this year 769,000 short of estimated requirements.

The W. P. B. allocation will permit the distribution of heavy-duty tires in sizes 8.25 × 20 and larger at the rate of 234,061 per month and the smaller sized truck and bus tires, sizes 7.50 and under, at the rate of 386,990 per month during the third quarter. Of the first-mentioned size group, 110,000 and 156,000 were released in the first and second quarters, respectively, and of the second size group, 216,000 and 314,000, respectively. There will be no easing in the availability of heavy-duty tires in sizes 10.00 and larger, because of the needs of the military forces in the Pacific areas. Tire users were warned not to expect any considerable increase in the number of tires that may be available this fall and were urged to be especially watchful of their tire use and wear during the summer months.

USED TRUCKS.— After August 1, 1945, only truck sellers who have adequate reconditioning and service facilities will be permitted to charge "warranted" prices for used trucks, according to an announcement made by the Office of Price Administration on June 11. A "warranted" truck is one that is in good operating condition and carries a written guarantee under which the seller agrees to make stated repairs at 50 per cent. of his normal charges during the 30 days following the sale or the first 1,000 miles of operation, whichever comes first. The O.P.A. will provide an "authorization to sell" at warranty prices for every dealer who shows repair facilities that qualify him to charge warranty prices. No seller can charge warranty prices on and after August 1 unless he has this authorization, which he must display in his place of business. This requirement is designed to operate for the protection of the buyer.

VETERANS.— The return from Europe and discharge of large numbers of men whose point ratings entitle them to release from the country's fighting forces makes it encumbent on employers to make themselves acquainted with the interpretation of Section 8 of the Selective Training and Service Act of 1940 as amended, issued recently by the Director of Selective Service and published in the April, 1945, issue of *Selective Service*, official publication of the Selective Service System, Washington. The Director interprets the provisions of that section to mean that "a returning veteran, who meets all of the re-employment conditions of eligibility required by the statute, has an absolute right to be restored to his former position or a position of like seniority, status, and pay. The only conditions upon the veteran's right to reinstatement," the interpretation continues, "are those specifically enumerated in the act: (1) That the veteran receive a certificate of satisfactory service; (2) that he still be qualified to perform the duties of his position; (3) that he make timely application for reinstatement; and (4) that the restoration be not unreasonable or impossible because of the employer's changed circumstances." The use of the word "seniority" in Section 8 does not, in the opinion of Selective Service, "qualify in any way the veteran's right to be restored to his old job or its equivalent. The term is applied only to the *alternative* job and as a measure of its nature and to provide the minimum of the alternative job which he may be given; that is, a position with seniority, status and pay equal to his old job."

Of special interest to cement chemists are two articles in this issue:

Methods and Procedure for Testing the Properties of Portland Cement, on pages 73 to 75, and

Chloroform Soluble Content Control of Air-Entraining Portland Cements, on pages 118 to 121.

Cement readers will recall the publication last year by Pit and Quarry of the pictures of cement-mill chemists in the July and October issues, as well as articles dealing with chemical problems in the cement industry.

Basalt Rock Co. Wins $1,000,000 Contract

A government contract for $1,094,337 covering both the production of rock and the erection of a breakwater at Alameda in San Francisco Bay has been awarded the Basalt Rock Company of Napa, California.

Material will be produced at the company's quarry at McNear's Point and will be transported by barge to the breakwater site. The quantity of material involved is reported to be 638,550 tons.

Cement Shortage Acute In Northern Colombia

According to the Department of Commerce, Colombia's 1944 cement production of 235,000 metric tons of cement was insufficient to meet the increased demand caused by an unusual building boom in that South American republic. The shortage was particularly acute along the northern coast, which is the area farthest removed from producing centers.

200-Ton Daily Output for Air Base Is Record of Plant Built in 23 Days

General view of the Graham Brothers plant near San Juan Capistrano, California.

another ON THE SPOT report

AS Uncle Sam's heavy bombers hit the runways of an airport, the impact of landing is terrific. In the rush to build paved runways quickly in the early stages of the war elastic landing strips of asphaltic materials were often laid, later to be replaced at many of the big air fields with thick slabs of permanent, high-strength concrete. And, to stabilize the structure beneath the slabs to prevent displacement of the subgrade in wet weather, thousands of tons of crusher-run base aggregates has been placed and compacted before the concrete was poured.

This was the procedure followed at one of the nation's big pilot-training bases, the El Toro Marine Air Station located near San Juan Capistrano, California. In its development huge quantities of concrete aggregates and crusher-run-base material were employed. The major portion of the material has been supplied by a plant built and operated by Graham Brothers, Inc., of Los Angeles, and located just 13 miles distant from El Toro.

A dragline excavating and loading a dump truck at the pit.

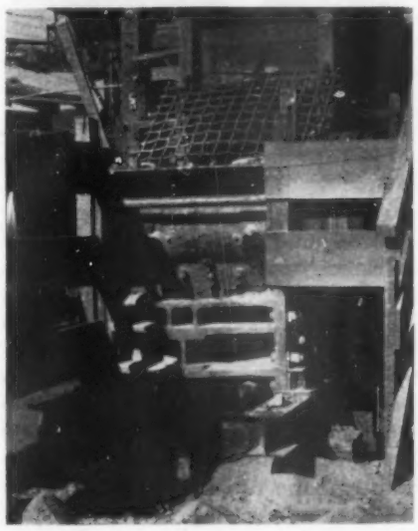
The plant, situated in Trabuco Canyon on the old Santa Margarita Ranch, replaced a small, older plant formerly operated by the big Los Angeles concern at the same location. It was designed by the company's own engineers. Erection began April 3, 1944, and it was in operation 23 days later. The plant is capably performing the task for which it was designed and easily produces 200 tons of specification material per hour, plus the added task of rejecting quantities of in-between sizes of undesired material at the screens. Few men are needed to maintain this high rate of production because of its simple design, its flexibility, and the uncomplicated arrangement of its equipment. Stock-piling conveyors automatically store surplus gravel when the truck-loading bins are full and parallel elevators feeding the main gravel-sizing screen can operate together or singly in case of the temporary failure of either.

From the pit to the plant hopper, a distance varying from ¼ to ½ mile depending on the portion of the deposit being worked, the pit-run material is transported by four 8-cubic-yard International C60 dump

By HARRY F. UTLEY

trucks. The material is excavated and loaded into the trucks by a Koehring gasoline-powered drag-line with a 1½-cubic-yard bucket. The plant hopper, of concrete and timber construction, has a capacity of about 30 tons, a rail grizzly with 7-inch openings spanning its mouth.

Below the hopper a 24-inch by 5-foot plate feeder, designed and built by the company, puts the material on a 30-inch by 160-foot belt conveyor. This conveyor slopes upward 15 degrees and carries the material to a 3- by 8-foot Austin-Western double-deck screen located above the crusher. The top deck of the screen has 3 3/16-inch mesh with ⅞-inch wire cloth on the bottom. The oversize is scalped off and chuted to a 10- by 40-inch Austin-Western jaw-



All crushing is done by a 10- by 40-inch jaw crusher.

crusher on ground level and in closed circuit with the 160-foot plant conveyor, the crushed material being returned by a short 24-inch belt. Material retained on the bottom deck, ranging from plus ⅞ inches to 3 3/16 inches in size is carried along for further processing and the bottom-deck throughs, from ⅞ inches downward, are loaded out part of

the time as crusher-run base aggregates. Should crusher-run material not be in demand, or if more sand is desired, this fine material is diverted, along with the remainder of the screen's products, to a 30-inch by 38-foot inclined belt-conveyor which discharges over a Simplicity 4- by 12-foot double-deck washing screen equipped with Link-Belt spray nozzles on both screening surfaces. The 7/8-inch woven mesh on the upper deck merely relieves the No. 4 mesh on the lower deck which takes out the sand. The sand and water are flumed a short distance to a sand drag composed of two 30-inch by 18-foot belts with drag paddles fastened at short intervals. The dual drag operates in a steel wash box, the water and silt being flumed away to waste. The sand is fed from a gate in the upper end of the box onto a 24-inch

View over the top deck of the 4- by 12-foot screen, showing spray nozzles.

by 180-foot steel-frame belt-conveyor which builds up a conical storage pile.

The gravel retained on both decks of the washing screen, ranging from 3 3/16-inch to No. 4 material, is carried by a 24-inch by 16-foot conveyor to the common boot of two belt-bucket elevators. One of these has a 22-inch belt and 20- by 7-inch buckets; the other is equipped with 14-inch belting and carries 12- by 6-inch buckets. Both units have a vertical rise of 55 feet and carry the gravel to the main sizing screen, a 42-inch by 12-foot trommel located above the truck-loading bins. This screen has 1 5/8- and 1 7/8-inch plate on its main cylinder and 7/8-inch, 3/8-inch and No. 4-mesh jacket sections to make the specification gravel required by the U. S. Navy. All the material between 3/8 inches and No. 4 mesh is rejected and bypassed to a 20-ton steel bin located alongside the

Three stacking conveyors from truck-loading bin. Revolving sizing screen is above the bin.

truck-loading bin, from which it is periodically hauled away to a waste pile by trucks. However, some of it is sold commercially for use in making driveways and for other purposes.

The three products of the revolving screen drop into the three compartments of the 160-ton steel truck-loading bin. These are designated by the specifications as No. 1 gravel (3 3/16-inch); No. 2 gravel (1 7/8- to 1 5/8-inch); and No. 3 gravel (7/8-inch). When the bin compartments are full, the surplus falls onto three steel-boom stock-piling conveyors emerging radially from the storage side at the top of the bin. These conveyors are suspended by wire ropes from the bunker, two having their belts on 36-foot centers and the other on 22-foot centers. All carry 24-inch belts. The boom conveyors build up cones of surplus gravel in open storage and the material is rehandled or loaded into trucks by a No. 105 Northwest 1 1/2-cubic-yard clam-shell crane. The same crane loads out all the sand. About 20,000 tons of finished material is usually kept in storage to insure an uninterrupted supply for the air base in case the plant is forced to shut down for any reason.

Dual sand drag, with paddles riveted to the belting at short intervals, operates in a steel wash box.

Wash water is supplied by a Pacific 500-g.p.m. deep-well centrifugal pump direct-connected to a 20-horsepower U. S. motor. All the equipment is driven by individual electric motors from power brought in on the high line of the San Diego Gas & Electric Company.

A large fleet of hired dump trucks transport the aggregates to the El Toro field. They are weighed before departure on a Fairbanks truck scale at the plant. About 10 miles of the 13-mile haul is made over the excellent pavement of U.S. Highway 101.

Credit for the design of this efficient plant, which is playing such an important role in the war effort, goes to Russell Graham, vice-president, and Charles Poe, construction superintendent of Graham Brothers, Inc. Mr. Poe supervised its erection and visits the operation almost daily to see that everything moves along smoothly. Michael Nielson is the plant superintendent.

The company is one of the big producers of aggregates and ready-mixed-concrete in southern California. Its general offices and shops are located at 4731 East 52nd Drive in Los Angeles. Besides its Los Angeles plants and the operation here described, it operates in Long Beach, Monrovia, Orange, Roscoe, Vernon, and Palos Verdes Estates. It is also interested in a quarry principally devoted to the production of rip-rap stone on Catalina Island.

A new gravel business, the Dry Creek Crushed Gravel Company, has been opened by Parker J. Wolfe near Dry Creek, Ohio.

Methods and Procedures for Testing The Properties of Portland Cement

By GABRIEL A. ASH

THE uses of Portland cement as a hydraulic binding material are manifold and extensive. During the last ten years the requirements in regard to its properties became more severe and definite. Consequently, cement users, and cement manufacturers as well, became vitally interested in creating new methods of testing, or in improving the old ones, inasmuch as the existing specifications did not cover the new demands of the practice.

Difficulties The problem of cement testing presents many difficulties. The present methods comprise chemical and physical tests. Commercial Portland cement is not an individual compound; it presents a heterogeneous system of several ingredients, existing partly in form of solid solutions, partly in form of crystalline individuals, and partly as an amorphous glassy substance.

The composition of Portland cement lies within certain limits, and, with respect to its major constituents, may be presented as a system of:

$$v\ (3CaO.SiO_2) + x\ (2CaO.SiO_2) + y\ (3CaO.Al_2O_3) + z\ (4\ CaO.Al_2O_3.Fe_2O_3)$$

in case the ratio of alumina to iron oxide is greater than 0.64, or as a system of:

$$v\ (3CaO.SiO_2) + x\ (2CaO.SiO_2) + y\ (4\ CaO.\ Al_2O_3.Fe_2\ O_3)$$

possibly $z\ (2CaO.Fe_2O_3)$, in case the ratio of the sesquioxides is smaller than 0.64.

The given general formulas show that comparatively large fluctuations in the relationship of the four major ingredients, lime, silica, alumina and iron oxide are admissible. In addition, Portland cement contains other ingredients, as magnesia, alkalies, sulphur, phosphorus, manganese and titanium in the form of oxides, the latter three compounds in small proportions. We know little about the form in which magnesia and alkalies exist in cement. It is, however, a well established fact that the amounts of magnesia and alkalies influence greatly the properties of Portland cement. The presence of more than 5 per cent. of magnesium oxide may cause deterioration of concrete and mortar. According to some observations, the effect of alkalies could be established even in cases where their proportion exceeded certain limits by fractions of a per cent.

The percentage of the oxides existing in cement may be determined by chemical analysis. Assuming that the major constituents of Portland cement are represented by the four compounds mentioned above, we have a method of computing the principal compounds from the oxides analysis. The hydraulic properties of each of these compounds are known, and it has been agreed that such a calculation makes it possible to determine the properties of cement from the values established by the chemical analysis. This method has been officially recognized, although studies on crystallization of cement compounds proved that the conditions are not so simple.

As long ago as 1936, a note communicated by the director of the United States National Bureau of Standards stated: "It thus appears that poor correlations obtained between the physical and chemical properties of cements and their calculated compound compositions may be due to inaccuracies in the method of computing the compound composition." (1)[1]

Nevertheless, despite the inaccuracies in the method, despite the fact the results of computing do not "necessarily mean that the oxides are actually or entirely present as such compounds," its application became very useful for the manufacturers and cement consumers. However, while giving useful comparative values, the four-compounds method can not be generally applied without some reservations. Strictly speaking, at present no formula based on the chemical composition of cement can predict its properties exactly, because two cements from different plants but of identical chemical composition as to their oxides contents, may differ widely in their properties as hydraulic hardening materials. It must be always borne in mind that "the concept of cement clinker as a mixture of phases, definitely determined by the composition and the heat treatment rather than as mixture of hypothetically existing oxides, has become established."

Conclusions In order to illustrate the divergence of opinions resulting from the application of analysis data, the writer would like to mention some conclusions in regard to relations between the computed proportions of tricalcium aluminate in cement and its resistance to freezing and thawing.

Studies on pure synthetically produced tricalcium aluminate established that this compound reacts rapidly with water, generating a great amount of heat, and shows little, if any, hydraulic hardening properties. These facts induced the majority of cement experts to consider the presence of this compound in cement undesirable, and present specifications limit the proportion of this compound. The testing of the durability of Portland cement by its resistance to freezing and thawing is certainly a severe test; and the deteriorating properties of tricalcium aluminate should be conclusively proved by this test. However, according to P. H. Bates (2), numerous tests carried out on various cements resulted in these conclusions:

1) There is a positive trend in the relation between the amount of this compound and the resistance to freezing and thawing.
2) There is a positive lack of trend in this relation.
3) There is a trend sufficient justify the use of the 8 per cent. presented in the standard.

This statement suffices to show the difficulties of the problem. In cement literature numerous facts are mentioned showing similar confusion in regard to conclusions based on the interpretation of the results of chemical analysis. The four-compounds formula covers a special case, when the compounds crystallize to complete equilibrium. The complex nature of the silicates, their high melting point, combined with high viscosity, making the reactions very slow, results in the fact that only in rare cases can constant equilibrium be reached. Therefore, the chemical analysis of such products as cement, whose chemical structure can be easily deformed by non-equilibrium in

[1] [Numbers in parentheses refer to the bibliography at the end of the article.—Ed.]

the process of manufacturing and afterward during the process of hydration and hardening, gives us only a general and rather a rough picture as to its actual compounds composition and its possible behavior.

Chemical Tests Generally speaking, the manufacturing conditions, especially the uniformity of raw mixes used for the production of cement clinker and the cooling of the produced clinker, affect the properties of the obtained product more than variations in the chemical composition.

Properly prepared Portland cement does not contain uncombined lime. The presence of free lime in cement affects its soundness and indicates defects in manufacturing. Therefore, the estimation of uncombined lime has always been of importance. For the determination of free lime, W. E. Emley's glycerol method is still the official one. (It is in some respects imperfect, because it estimates simultaneously the existing free lime as well as lime-hydrate released from the calcium compounds of cement as a result of humidity during the storage, or as a result of prehydration.)

The understandable desire to get a correct concept of Portland cement by means of a speedy chemical test induced some of the users to introduce special methods. One of them is the sugar solution test advanced by T. Merriman of the New York Board of Water Supply and included in the cement specification of this institution. This test, according to Merriman (3), "affords a quick and ready means for determining whether a cement has been so completely calcined that it will remain reasonably stable in the presence of water during the operation of mixing and placing concrete and, whether it has been appreciably prehydrated." The low solubility in 15 per cent. sugar solution indicates a thoroughly burned and carefully manufactured cement. Without going into the discussion of the scientific and practical merits of this test, the writer would like to state that in his opinion the sugar solubility test is not conclusive with respect to clinker quality. Cements originally failing in this test pass easily upon addition of 1 per cent. gypsum. Moreover, he has been informed that "cements with high solubility, when exposed to moist air, would then have low solubility." Thus, it would appear that this test has little, if any, value for determining the stage of prehydration.

During the past years the attention of American cement experts has been attracted to the problem of the effect of cement alkalies on concrete. Some deformations of concrete constructions have been ascribed to the presence of these compounds. The amount of alkalies in commercial cements is small; in rare cases it exceeds one per cent. It has been observed, however, that cements containing more than 0.5 per cent. of alkalies cause "destructive chemical combinations with the mineral constituents of certain aggregates". Since the great majority of the American commercial cements contains more than 0.5 per cent. of alkalies, this fact, if conclusively established, would certainly result in unpleasant consequences for the cement producers. Fortunately, "the mere fact that a cement has a higher alkali content can not in the light of present evidence be considered as conclusive evidence of probably early or even ultimate adverse reaction, regardless of the aggregate type, and some other test such as one of cement and aggregates in combination is necessary." (4). This statement emphasizes again the often stressed fact that Portland cement is only one of the factors which affect the strength and durability of concrete; other factors, in this case the character of the aggregates, play their part; and the results of chemical tests, though of cardinal importance, do not give the whole picture.

Methods of chemical tests have not developed any basic changes in the last ten years. For rapid determinations of certain ingredients, new methods have been adopted: the ammonium chloride method for determining the amount of silica, and the estimation of magnesium by means of the titration of its oxy-quinolate compound.

In addition to the chemical tests, better control of the quality of cement clinker can be achieved by use of petrographic and microscopical methods of investigation. As a rule, cement manufacturers do not use the petrographic method regularly but where the petrographic examinations were frequently made, comparative results were obtained which were of great value in estimating the uniformity of burning. The petrographic method in which thin sections of clinker are used has some disadvantages, since it is impossible to grind sections thinner than 20 microns. Under these conditions, it is possible to observe a single crystal in the section only if the size of the crystal is greater than the thickness of the section, and crystals of the size of 20 microns or smaller can not be observed free from "overlap". Therefore, in many cases, more conclusive results could be obtained by means of the metallographic method, based on examining with reflected light the polished surface of a cement clinker etched with a suitable reagent.

As has been mentioned, Portland cement contains an amorphous glassy substance, whose chemical nature is not definitely established. According to W. Lerch (5), various samples of clinker showed large differences in their approximate glass content, ranging from zero to 22 per cent. The glass content was highest in the rapidly cooled clinkers and lowest in the slowly cooled ones. Cements of higher glass content hydrate more rapidly and generate higher heats of hydration at early ages.

Physical Tests Since the extensive use of Portland cement is due to its ability to harden when mixed with water and to develop that hardening when exposed to the atmosphere or submerged in water, the ultimate test of its binding properties is evidenced by physical methods.

The requirements regarding the properties of the cement structure are created by the needs of the constructional practice, and this fact prerequisites the kind of testing.
A satisfactory hardening process and sufficient strengths are not the only properties required. Other phenomena, such as thermal effects, shrinkage and expansion, elasticity, durability of mortar or concrete and its resistance to specific agents, such as aggressive waters, are of importance.

Special purposes create special demands, enlarging the field of research; and it is not surprising that, in spite of the amount of experimental work, the methods worked out are far from perfect.

The present methods of testing the tensile, compressive and flexural strengths of mortar or concrete give reliable comparative results. They are more reliable when testing of specimens is carried out for a longer period of time, because the resistance of specimens at the ages of 3, 7, and even 28 days does not guarantee that the strengths would not decrease at later dates. In addition, the strengths established by the tests in the laboratory do not correspond with those obtained from the same mix in field tests. This fact is not surprising, when it is considered that field tests of the same concrete mix at different times often show large discrepancies.

"The engineer may find that a set of test specimens made one day may be two or more times as strong as those made another day, yet, so far as has been practically possible, the cement, the quality of the aggregates, the water content, the proportions of mix, the method and time of mixing and the moulding of the test pieces have been kept the same throughout." (6) This statement, made more than ten years ago, remains unchallenged, despite improvements in the methods of preparing and curing of specimens during the last decade. In fact, quite recently, at the A.S.T.M. meeting in 1943 it has been repeated that "in the interpretation of laboratory test results, especially when concrete specimens are tested at early ages, extreme care must be exercised to eliminate the possibility of assuming a correlation with field behavior which may not exist." (7)

The user, however, is looking for a speedy and reliable method. The present standard tests do not provide such.

Commercial Portland cement is a product of very fine grinding of cement clinker. The degree of grinding is of importance, since the fineness affects the time of set and the strengths, the amount of mixing-water and, according to some observations, volume changes during the process of hardening. The fineness of cement is usually determined by sifting. The sieve tests do not show decisive results for the active part of cement. The best indications of the granular composition of cement are obtained by means of sedimentation and the micro-measurement of the size of the separated grains. Fairly correct comparative results in regard to the general granular composition give the determination of the specific surface by means of the Wagner turbidimeter.

However, the determination of the surface area gives an incomplete result with respect to the properties of cement, since cement clinker ground by closed circuit and the same ground by an open circuit, giving the same surface area, may differ in their water requirement, strengths and shrinkage. Generally, it can be stated that an increase in the specific surface of a cement results in producing more gel during the hydration and, consequently, greater strengths, especially at early ages. On the other hand, it causes a larger volume change and increases the heat of hydration. Therefore, there exists a difference of opinion as to the desirability of a very fine grinding. This question, like many others concerning cement, can not be considered *per se*. The effect of the fineness depends upon the nature of the cement clinker. A properly composed, sharply sintered and correctly cooled clinker, when finely ground, will produce a more workable mix, will reduce the effect of free water and, by forming more gel, diminish the development of pores in the concrete. The increased fineness of an insufficiently sintered clinker would not improve its hardening properties; it might even have an unfavorable result, causing volume changes, formation of laitance, efflorescence and unsightly weathering.

Heat of Hydration In connection with the use of Portland cement in mass concrete, the amount of heat generated by cement during hydration has attracted the attention of cement users. It is not within the scope of this article to discuss the effects of different factors on the durability of mass concrete and the complicated movements in it during hardening. It should be mentioned, however, that the heat of hydration plays a subordinate role in comparison with other factors. Nevertheless, since the interior of mass concrete dries very slowly and since considerable strain may be caused by the variations of temperature due to the heat of hydration, users of cement for mass concrete looked for a brand developing the minimum of heat. The adopted "heat of solution" method gives reliable results. It consists of determining the heat solution of unhydrated and that of hydrated neat cement in a mixture of nitric and hydrofluoric acids and the calculation of the heat of hydration by subtraction.

It should be pointed out that cements generating less heat of hydration have lower strengths, especially at early ages. In the opinion of many engineers, however, this fact is not of great importance, since the working stress in mass concrete is low. The amount of heat of hydration prescribed in various specifications is expressed in calories per gram of cement. In the opinion of the writer, it would be of advantage to specify the heat of hydration not in calories per gram, but in ratios of the strength produced by a unit of cement to its heat of hydration. In this case, the advantages of a low-heat cement for mass construction might be considered in its true light, and disappointment caused by slow and insufficient hardening of the low-heat cements, when placing concrete at lower temperature would be avoided.

Hardening, Setting In practice, it is important to use cement possessing reasonably slow stiffening properties. The well known methods for determining setting time by means of Vicat or Gillmore needles give the user a certain security regarding the time of mixing and placing mortar or concrete.

Hardening of cement is accompanied by volume changes which may cause cracking in the structure. In order to determine this tendency, various tests have been worked out. The usual tests for "volume constancy" comprise testing neat cement pats in steam at atmospheric pressure, of boiling cement pats in water for several hours or curing in water for 28 days. Unsoundness is manifested by the appearance of cracking, distortion, and other signs of disintegration.

Apparently, the existing methods did not satisfy all cement experts, because quite recently a new method of testing for soundness has been adopted. Neat cement bars are subjected to a steam pressure of 295 pounds per square inch for 5 hours and the resulting expansion, which should not exceed 0.5 per cent, is measured. Whether this autoclave test will give the user more adequate protection in relation to the soundness of cement remains to be seen. The good behavior of neat cement paste does not give an absolute guarantee as to the behavior of concrete made of the same cement.

The properties of Portland cement are affected by the addition of small quantities of certain matters. One such admixture has been in use for many years. It is gypsum, used as a retarder of setting; others, such as calcium chloride, act as accelerators. According to Dr. L. Forsen (8), the setting retarders are compounds which decrease the solubility of the aluminates and produce the precipitation of a semi-permeable protective integument on the cement grains. The accelerators, decreasing the pH value of the reacting solutions, hasten the dissolving of the silicates and, by enriching the proportions of Ca-ions, promote the precipitation of calcium-silicate hydrate without an increase in the solubility of the aluminates.

There are other admixtures which probably do not affect the properties of cement, but which produce certain conditions in mortar or concrete, for example, improving the surface resistance, water impermeability or the workability of the mix. Thus,

(*Continued on page* 78)

New Pulverizing Plant at Annville Produces Agstone from Famous Deposit

View of Annville Stone Company quarry, showing mine entrance (left), primary crusher building and compressor building (right).

Gasoline shovel loading Diesel trucks in the room-and-pillar workings. Since room is close to face, there is no danger from fumes.

another ON THE SPOT report

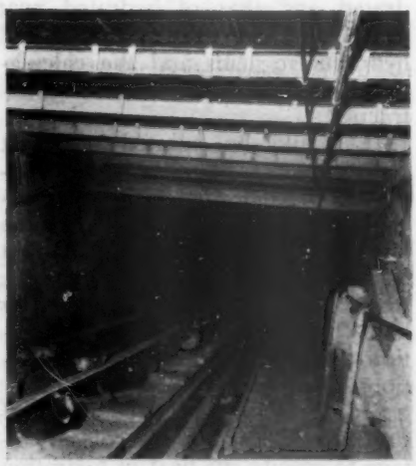
ONE of the most important formations of limestone on the American continent is located not far from the world-renowned chocolate center of Hershey, Pennsylvania. This formation, known as Annville limestone, has for many years been

View of three-roll mill in the agstone plant. Note horizontal disc-type feeder.

an important source of chemical and fluxing stone and has through the years become increasingly important to the Lehigh Valley cement district which has bought this stone in large quantities to supplement the stone in its own quarries.

One of the most important operations in this formation is that of the Annville Stone Company, Annville, Pennsylvania, which has been producing stone for these industries from its deposit near Hershey since the turn of the century. Over a year ago the company decided to add to the list of its products agricultural limestone, a material for which this high-grade, high-calcium limestone is ideally suited.

In February, 1944, a new pulverizing plant for producing agricultural limestone was completed and placed in operation, and is now turning out close to 600 tons daily



A 400-foot inclined conveyor tunneled through rock delivers stone from the primary crusher to the crushing and screening plant.

on two-shift operation for direct shipment in bags to the A.A.A.

The 150-acre deposit contains a vein of 97-per cent. $CaCO_3$ which is about 170 feet thick and pitched on a 45-degree angle. Until about three years ago the deposit was worked in two open pits of about equal size, connected by an 800-foot roadway tunneled through the rock.

By WILLIAM M. AVERY

This method of operation was finally abandoned in favor of underground mining in order to eliminate contamination and to recover stone of maximum quality. The first underground recovery was from a room-and-pillar system driven from the quarry floor 100 feet below the ground surface, employing Osgood shovels and Euclid Diesel trucks, but in January, 1943, work was started on the sinking of a double-track mine slope.

Despite delays occasioned by the man-power shortage and the difficulty of obtaining equipment and

Battery locomotive used in mine tunnel.

Above: View of Annville Stone Company plant, showing direct loading of freight cars. Right: General view of plant. The agstone building is at the left.

materials, the 20- by 9-foot incline has been carried to a point over 400 feet below the ground surface, where haulage ways have been driven in preparation for shrinkage-stope mining. A level has been opened about 110 feet down the slope for development, ventilation and temporary production. Ventilation raises will be broken into this level when shrinkage-stope operations have been developed.

A single-drum 150-horsepower Lidgerwood mine hoist handles the skip cars on the double-track, 45-per cent. grade from the mine to a surge bin on the floor of the quarry. The 40- by 48-inch Buchanan jaw crusher is fed from the surge bin by a Ross chain feeder, or by direct dumping from the Euclid 15-ton Diesel trucks when stone from the room-and-pillar workings is being used. From the primary crusher the material is discharged onto a 36-inch by 420-foot Robins belt-conveyor which operates in a tunnel through the rock from the quarry floor to the ground surface on a 23-degree slope. This conveyor, which is equipped with a Circle-Hewitt belt, has been in constant use for more than a score of years, and there is no evident reason for its replacement in the foreseeable future.

The stone is discharged into bins at the crushing and screening plant, and the open-hearth (plus-6-inch) and blast-furnace (3-inch by 6-inch) sizes are separated on a triple-deck Robins Gyrex screen from which they are chuted directly into railroad cars for shipment. The minus 3-inch stone drops onto a 24-inch belt-conveyor which feeds it to a Telsmith triple-deck vibrating screen where it is sized and either loaded direct into cars for shipment or conveyed to the pulverizing plant. The oversize from this screen is reduced by a Telsmith 36-inch Gyrasphere crusher which is arranged in closed circuit with the screen.

The layout of the crushing plant makes it possible to divert the larger sizes of stone to a Telsmith 13 B gyratory secondary crusher in order to increase the volume of feed for the pulverizing plant, for which 2-inch or 2½-inch stone is considered most suitable. The flexibility of the original crushing and screening plant is clearly evidenced by the fact that no new crushing and screening capacity was required in order to provide feed for the new pulverizing plant.

To make the pulverizing plant independent of the mining operations to some extent, bin-storage capacity has been provided for 550 tons of stone adjacent to the plant, and the company plans at some time in the future to employ stock piles and tunnel reclaiming conveyors for additional reserve storage. The intention is also to reclaim a considerable tonnage of minus 1½-inch stone which has been accumulated in the storage yard over a period of years.

A 24-inch by 72-foot belt-conveyor delivers stone from the crushing and screening plant to the agstone plant, discharging either direct into the main 400-ton storage bin or onto a 24-inch by 70-foot by-pass conveyor for delivery to the

Plate-type feeder ahead of one of the rotary crushers.

Bagging machine and portable belt conveyor used for loading cars.

A chain feeder feeds stone from the skip cars to the primary crusher.

pulverizer feed bins. This arrangement makes it possible to by-pass the 6-inch by 30-foot oil-fired rotary drier when it is not in use. When the drier is in operation it is fed either by direct discharge from the main conveyor into a 50-ton feed bin or from the 400-ton bin by means of a 65-foot Link-Belt inclosed bucket-elevator. The flow of stone from the feed bin is controlled by a Robins plate feeder, and a Sturtevant blower draws the heated

The 150-horsepower single-drum man-and-material mine hoist.

air counter to the flow of the stone, exhausting through an 8-foot cyclone. The drier discharges into a 55-foot Link-Belt elevator which delivers the dried stone to the two 50-ton feed bins over the pulverizer.

The 3-roll Bradley Hercules mill is fed by a horizontal disk-type feed table which cuts off automatically when the load on the mill drive reaches 85 amperes and resumes feeding when the load drops to 80 amperes. The automatic control feature assures the maximum production while providing an excellent safeguard against overloading.

The entire production of the pulverizing plant is bagged for railway delivery on A. A. A. contracts exclusively. The pulverized stone from the mill is delivered to an 85-ton bin over the St. Regis bagging machine by means of a screw conveyor and an enclosed bucket elevator. Two portable belt-conveyors are used for loading bags into cars and there is storage capacity in the packing room for 400-tons of finished product.

The plant produces 45 t. p. h. of a product which tests 100 per cent. through 20-mesh and approximately 90 per cent., through 80-mesh. Two-shift operation is maintained, with two men at the bagging machine, two loading cars, one stationed at the pulverizer and a sixth man to look after the conveyors and the drier.

Cement Testing (*from page 75*)

finely divided anorganic matters increase the plasticity of produced mortar or concrete. This effect is probably due to the increase in the surface area. During recent years the use of certain organic admixtures has been largely recommended. In many cases definite improvement has been made in resistance to freezing and thawing. The action of organic admixtures consists of whipping air into the mortar during mixing. However, there are other explanations of the action of organic admixtures.

It has been observed that the air-entrapping Portland cements show a reduction of strengths. This fact has to be considered when, in order to improve the durability of concrete, organic admixtures are used.

It must be stressed that the methods of determining the properties of Portland cement are not perfect, due to the complicated nature of cement. Each of the tests gives more or less complete indications as to the character of cement and its behavior when used in mortar or concrete. The character of cement, however is only one of the numerous factors which affect the properties of concrete. Considering the use of any of the existing brands of cement for the construction of large dams, the user looks for one developing the minimum of heat of hydration. However, according to J. L. Savage, "it is apparent that the placing of temperature may have a much more important bearing on the temperature drop and consequent contraction of the concrete than any change that may be effected by varying the heat-generating characteristics of the cement." (9)

Despite the established fact that there is a lack of relation between the chemical composition of cement and its physical properties, the specifications adopted in this country have developed five types of Portland cement. From a purely theoretical viewpoint, the limitations of the compounds proportions in the types II, IV and V are not justified. From a practical standpoint, the present classification is of advantage providing the consumer with a certain protection as to the use of a specific type for a special purpose. Most of the cements produced in this country which exceeded the limits of the specifications showed less favorable results than cements whose compounds composition lay within the stated limits. This fact, however, does not eliminate the evidence that there are discrepancies between the predicted and the actual behavior of cement and that results of testing have to be accepted with some reservations. There is general agreement with P. H. Bates' opinion, that should we recognize this element of uncertainty, "many of the statements of the quality of cement and predictions regarding its future deportment in service would not be made with the positiveness and finality which now characterizes them." (10)

BIBLIOGRAPHY

1. *Journal of Franklin Institute,* Vol. 221 (1936), pages 433-434.
2. *Proceedings,* A.S.T.M., Vol. 40 (1940), page 476.
3. *Rock Products,* March, 1938, page 64.
4. *Proceedings,* AS.T.M., Vol. 43 (1943), page 875.
5. *Journal of Research,* National Bureau of Standards (1938), RP. 1127.
6. Davey, N., *Concrete and Construction Engineering,* Vol. 24 (1931), page 311.
7. *Proceedings,* A.S.T.M., Vol. 43 (1943), page 1063.
8. Forsén, L., Paper presented at the convention of German Portland cement manufacturers, Berlin, 1938.
9. Savage, J. L., "Special Cements for Mass Concrete", page 3.
10. *Proceedings,* A.S.T.M., Vol. 40 (1940), page 488.

Gravel Deposit Yields Array of Indian Relics

Anson M. Simpson and several other archaeologists from the Peoria Academy of Science at Peoria, Illinois, have uncovered thousands of Indian articles dating back to the Mississippian culture, during excavations on the property of the Kingston Gravel Company on Kingston Lake. Items such as bone needles, awls, fishhooks, chisels, bracelets, knives, plaques, drills, scrapers, pipes, axes, hammerstones, whetstones, carbonized corn, an anchor and many vessels(most of them in fragments) were reclaimed from the gravel deposit.

OREGON PLANT PRODUCES SILICA SAND FOR FOUNDRIES FROM RESIDUAL DEPOSIT

Stockpile of washed sand on concrete slab with loading scoop at right. (Washing plant in background.)

HIGH-GRADE silica sand is being produced at Eugene, Oregon, by Silica Products, Oregon, Ltd., and shipments are being made to Portland and Seattle steel foundries. This company's washing and drying plant, built by the Defense Plant Corporation, is located about a mile north of the deposit, which is about 3 miles west of Eugene, Oregon. The company's home office is at Portland.

It is probable that the Eugene sand is a residual deposit formed by the weathering of an indurated sandstone in the Eugene formation of Oligocene age. The uniform grain size of the sand suggests that it may have been derived from nearby older sandy formations, such as the Spencer or Tyee of Eocene age, which in turn may have been derived from the old Klamath Mountain highland. Such re-working, plus possible transportation by wind to form dunes as suggested by field observations, may explain the unusually uniform grain size of the Eugene sand. The Eugene sand is strikingly similar to sand which is found in the Millville area of New Jersey and is used extensively by steel foundries in the Atlantic Coast region.

The pit material is about two-thirds silica sand and one-third fire clay. As it contains too much clay to be used as a naturally bonded foundry sand, it must be washed, and the Silica Products plant was built for this purpose. The raw material is loaded at the pit into trucks by means of a P & H dragline. It is then transported 1½ miles to the plant, where it is dumped into a hopper from which a drag-type conveyor-feeder carries it to a log washer. From the log washer the sand goes to a duplex Dorr classifier. The overflow carries off most of the clay and the partially washed sand drops into a 40-foot sand drag. The overflow from the sand drag

New Washing and Drying Plant Produces 200 Tons Per Hour

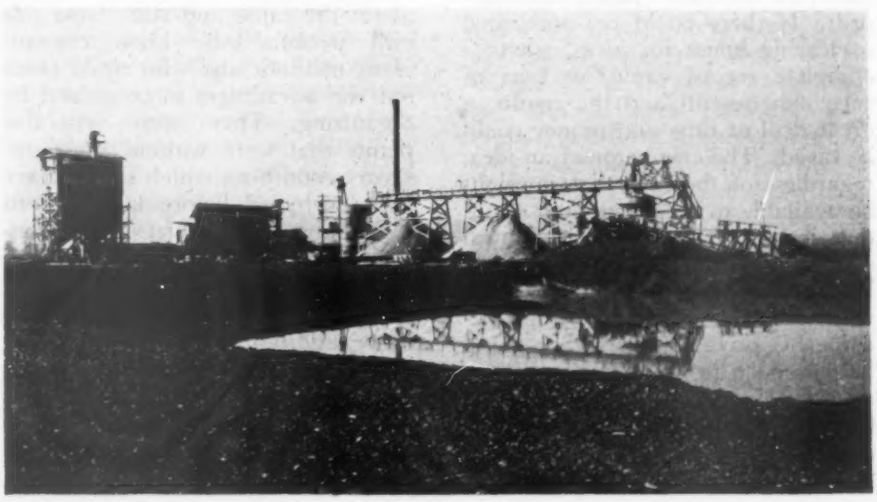
carries off nearly all the remaining clay, though a desirable partial film of clay is left on many of the sand grains. The sand from the drag classifier is elevated to a belt-conveyor which carries it to the stock pile. A Scoopmobile is used to transfer the sand from the stock pile to a hopper, from which a bucket-elevator carries it to the top of the steam drier. As the sand dries, it drops down through a network of steam pipes, and is fed to a belt-conveyor by a series of Syntron vibrating feeders, after which it is elevated and screened, and drops into bins for loading into railroad cars by gravity feed. The boilers for the drier are coal-fired by Iron Fireman overhead-feed stokers.

The washing plant has a capacity of about 20 tons per hour. The water consumption is approximately 1,000 g.p.m., the water being pumped from a pond of 6,000,000 gallon capacity, which is on the property. The waste water containing the clay runs into settling ponds, and the clear water overflows into the main pond. Thus, the water is used in closed circuit, and pumping is the major cost. The clay is very refractory above P.C.E. Number 31, and will be used in the manufacture of fire brick, and for other uses.

The plant was built after several months of research and test work had proved the material to be of

(*Continued on page* 81)

Panorama of Silica Products, Oregon, Ltd., showing north settling pond, screen house (above bins) and dryer.



The Cement Industry In Retrospect and Prospect

By J. F. KAUFMAN
Former Chief Engineer, Ideal Cement Company

another P&Q exclusive

ARTICLES pertaining to the cement industry are generally written by those actively engaged in the manufacture of cement or cement-mill equipment. Very seldom does any one leave this close fraternity, as it is a well-known fact that cement-mill men die in the harness. This article is different because, after twenty years of work in design and operation, the writer decided to retire. He can look objectively at the industry in comparison with other industries, and with a mind free to take it apart and see what makes it tick.

On close study and analysis, it now seems to me that the greatest enemy of the industry is its traditions. When a new man enters the field, he is immediately surrounded by age-old traditions, and is expected to follow along the lines laid down by the requirements of the past, many of which are present-day handicaps.

Other industries are constantly searching for new talent and new ways and methods; they employ consulting experts to make studies and recommendations. Men with no particular skill in the special line are invited to take a bird's-eye view, unbiased by close association, and to make suggestions for improving either the product or the method of its manufacture.

Not to any extent does the cement industry follow this pattern. Here management observes the ups and downs of production and costs without knowing what to do about it. This situation is due chiefly to lack of proper planning and failure to maintain adequate production records. If there could be established a clearing house for ideas, where a complete record could be kept of such experiments and the results, a great deal of time and money could be saved. The originator of an idea, regardless of the fact that it might be available to his competitor, could describe his idea to the central agency and find out if such an idea had been tried before, and if so, with what success. It could either become his private property or could be passed on to the members of this agency. How much money and time has been wasted on different methods of recovering waste heat from kilns will never be known. In numberless plants there are discarded methods of heat recovery, slurry drying, dust collecting. Most of these methods had been tried out before and found to be failures; and many operators would never have tried them, had such an agency been consulted.

Within the industry, many good ideas have been developed and have led to valuable improvements, but as a whole it has been the manufacturer of cement-mill equipment who has pioneered the most important improvements. To these people we owe the development of most of our modern equipment, most of which has been made during the last fifteen years.

Labor The cement industry for many years was not vulnerable to union organization, although in some remote parts plants were organized over twenty years ago. This probably was due to the vertical plan of union membership, which embraced the different trades in a plant. Not until the scope of membership included all employees did organized labor invade the cement industry. Due to the lack of experience with union methods and objectives, management was prone to fight labor's attempts to organize. In many instances employers aggravated situations that could have been handled without jeopardizing their relations with the workers.

The failure of many a plant to recognize the handwriting on the wall caused breakdowns in what could have remained friendly negotiations. The methods of plant organization as used by union leaders worked very well; the organizers were enthusiastic about the cause and were *bona fide* mill workers who knew cement-plant methods and who could point out the advantages to be gained by organizing. There were very few plants that were without some unsavory conditions which should have been corrected before labor forced the change. The first union contract generally made very few demands on management, but could not be met without losing face. Later, additional and more exacting demands were made in the negotiation of new contracts. Labor's grievances became a constant threat to efficient operation. Usually the grievances were of little consequence to start with, but, due to dilatoriness at times on the part of management, they grew into real cases which found their way to the National Labor Relations Board with disastrous results.

Labor restrictions have worked a hardship in plant operation; they have siphoned off trained operating personnel to the armed forces and to war plants and other essential industries. With the cessation of hostilities, thousands of men will be looking for peace-time jobs. Post-war plans indicate that there will be a large demand for cement for some time to come. It will be a difficult problem to attempt to meet this demand with plants understaffed and lacking repair material.

The outlook for labor supply should be good, and the quality of potential labor will have improved. Men returning from the armed forces have learned discipline and various trades; those now in war plants have been trained in many different crafts and will be anxious to return to private industry. The wise plant manager will have worked out a new and different method of training his operating personnel. He should know how to fit the right man to the right job and see that the man is properly instructed in the efficient performance of it. Some firms have found it profitable to hire trained employment specialists to select and train new employees.

Too much stress can not be laid on the proper training of employees as a safety factor in careful operation. This is the time to start that training in good housekeeping. Plants can be kept clean if employees are trained at the start to be tidy about their stations. A good way to accomplish this objective is to put a broom into a man's hand his first day on the job and to impress on him that it is just as important to keep things clean as to handle his equipment. Another good practice to create interest on the part of the employee is to see that he is informed about his production, and about other factors pertaining to his job. He should be made familiar with other parts of the plant and should learn how it functions as a whole. He should realize the part he plays in keeping the plant free from accidents, production up and cost down. In analyzing the labor

cost of many plants it has been found that the cost was lowest in the plants that were the cleanest, all due to proper management and close supervision.

There is likely to be a greater trend toward the adoption of insurance plans, and retirement benefits. Incentive plans used in other industries may be beneficial in increasing production and efficiency. Labor will want to share in the profits of all industries. We may face a government plan to guarantee an annual income.

New Cements The industry itself is partly responsible for the present multitude of cement specifications. With demand for increased cement production there will no doubt be a flood of new types of cement designed to overcome still undiscovered difficulties. The cement industry should keep a close watch on those who would saddle it with a great variety of specifications and methods of inspection.

The cement manufacturer has survived many a scare in the past few years over the quality of cement and the discovery of conditions that would jeopardize the sale and use of his product. Proper grinding of the raw and finished products, combined with skillful burning, has overcome most of these worries. Bleeding and alkaline action have ceased to be major problems, and many other obstacles have been overcome.

A modern trend in the use and design of concrete structures may help the cement producer. We may take a lesson from European designers in utilizing the full strength of possible cement mixtures. It has always seemed foolish to produce a cement that would make 3,500-pound concrete and then design a structure using a 2,500-pound factor. A closer working relation with the design engineer would take advantage of the full strength of concrete mixtures. With close supervision of the mixing and blending of mixtures a lower factor of safety could be used. As it is now, the design is always made on the safe side, as the engineer might not have control of the mixing and placing and, therefore, is afraid to stress the concrete to the limit of what it will take.

New markets will open for the use of cement. The South has made severe inroads in its lumber supply; the pulp-wood industry is consuming an unbelievable amount of undeveloped pine, and the war has taken from the entire country great quantities of timber that would otherwise have gone to satisfy peacetime requirements. The post-war demand for new homes will require great quantities of building material, and much of it will be cement.

New Equipment The demands of our armed forces virtually stopped the production of new cement-mill equipment, and most plants have suffered materially from the difficulty of obtaining repair parts to maintain operating efficiency. This has resulted in a reduction in the cost of repairs per barrel of cement produced, but has shown up as added cost in lost time and production. Plants which formerly spent from 7 to 10 cents per barrel for repair materials have cut these costs to 3 cents; but it has taken all the ingenuity plant management could muster to keep things going. Labor cost has gone up, due to the unavoidable use of inexperienced labor and the resulting lowered production. To meet the future demands for cement, there will be a great need for replacements. Mill-equipment manufacturers, although for the time being engaged in making war material, have not neglected their research work; and they no doubt have many new designs which will be released when they can turn their attention exclusively to the manufacture of cement-mill equipment.

In the design and arrangements of grinding units there has been progress from 2-stage grinding units of small capacity to multiple grinding mills of large capacity, with an accompanying demand for increased power. More recently we have returned to 2-stage grinding with larger mills for larger capacities with various methods of air separation, in an attempt better to classify the finer material in the percentage of fines to give the higher strengths demanded. It is evident that you can get only so much reduction in fineness with a given speed-diameter ratio, combined with the proper load and sizing of the grinding media for material fed to the compartment.

Many improvements have been made in the design of kilns and coolers. The air-quenching cooler, with the different methods of heat recovery, has been a great improvement, not only from the fuel-saving standpoint, but in terms of increased grindability. Direct-fired units burning coal have contributed to a major saving in fuel and increased output. Plants in the gas zones have reduced fuel consumption and increased production by using high-pressure gas burners with from 20 to 75 pounds pressure. In this type of burner the burning range and zone can be very closely controlled. It has increased the life of refractories and has helped to reduce the formation of rings.

The efficient arrangement of chains with forced draft and dust collectors has increased production and reduced burning cost. Chains will pay dividends even when installed in the most unorthodox manner. The selection of exhaust fans and dust collectors for kilns requires considerable study, and too much stress can not be laid on the making of a proper dust count and analysis before determining the best type of collector to install.

Several types of slurry filters now on the market have proved very satisfactory in the reduction of moisture. In some cases slurries with 50 per cent. moisture have been reduced to 25 and 30 per cent. It must be understood that all slurries do not have the same filtering characteristics, and it is advisable to run many tests from all the available raw materials before deciding upon the proper filters and filter areas.

There has been a brisk demand from other countries for second-hand machinery, and when shipments can again be made there may be an opportunity for many companies to dispose of obsolete equipment at good prices and to modernize their plants with equipment of the latest design. The war-torn countries of Europe will be desperately in need of cement to rebuild their devastated cities and industries, and there will very probably be a large demand for additional cement-producing capacity in Latin American countries.

Sporadic efforts on the part of management to find solutions are too often costly and ineffective.

Oregon Plant (*from page 79*)

superior quality for steel foundry and other uses. The greater part of the investigation was done by the Oregon State Department of Geology and Mineral Industries. Dr. Wallace D. Lowry, economic geologist, and Ralph Mason, mining engineer, both of the state department, supervised the field work and the foundry tests, and full credit should be given to them for developing a new and important industry.

The company is operated by a limited partnership. L. E. Bufton, well-known construction engineer and contractor, and K. E. Hamblen, mining engineer, are general partners and co-managers.

Portland Cement Assn. Safety Program Spurred to Halt Rising Accident Rate

By A. J. R. CURTIS
Secretary, Committee on Accident Prevention and Insurance, Portland Cement Assn.

another P&Q exclusive

MOST people acquainted with the nonmetallic-mineral industries know that cement manufacture was reckoned at one time as one of the most dangerous of occupations. Later, the cement industry became safety-minded, went "all out" for safety and ridded itself of 95 per cent. of its accidents in 10 years.

Then the picture changed again under the combination of handicaps that appeared with the war, and notwithstanding its well-organized accident-prevention program accidents increased in the cement mills and quarries at a rate considerably higher than that experienced by several of the heavy industries which had not been able to keep up with the previous gains of the cement fellows.

Here's the story of the cement industry's decline safetywise since its best record, in 1939, as reported to the Portland Cement Association:

Year	Accident Frequency[1]	Accident Severity[2]
1939	4.26	2.02
1940	4.90	2.46
1941	5.99	2.22
1942	7.58	5.11[3]
1943	7.78	2.26
1944	8.47	2.96

[1]Accidents per million man-hours of exposure.
[2]Days lost per thousand man-hours of exposure.
[3]Not counting the Sandt's Eddy catastrophe the rate would have been 2.26.

These figures show that the record of the industry as a whole was quite unsatisfactory, particularly to an industrial group which had made such brilliant progress during the fifteen previous years. But it should not be assumed that all individual plant records were bad or even poor. Some of the records for 1944 exceeded past performance; many plants equalled their best records for former years.

Labor Most plant managers complained of handicaps such as the necessity of employing poorer quality labor than formerly and of severe shortages of labor. While this situation probably existed to a greater or lesser extent in all or practically all of the reporting plants, the fact that some of them turned in good or even perfect records during this period would indicate that troubles due to inefficient or insufficient help were not the only causative factors in these higher accident rates.

The great spread in the volume of accidents as between plants not differing greatly in size, volume of operations or other characteristics probably suggests other reasons for

U. J. Hanley, chairman, Committee on Accident Prevention and Insurance, Portland Cement Assn.

individual plant records which brought down the industry average.

Dividing the industry accident reports for 1943 into four groups each containing 25 per cent. of the reporting plants, the best group suffered no accidents, the second best suffered 33 accidents, the third group 88 accidents and the last group 274 accidents. Dividing the plant records for 1944 similarly, the best 25 per cent. suffered no accidents, the next 25 per cent suffered 38 accidents, the next 25 per cent. 86 accidents, the last 25 per cent., 211 accidents.

There is surprisingly little difference in hazards between these groups. Considering them from almost every viewpoint, each group is almost a standoff for the others. Certainly, if one group could operate a year with a clear accident record, there appears to be no good reason why any equal number of similar plants should have 211 accidents, or even 86 accidents during the same period.

Safety Effort Of course there must be some very real difference to account for the very great variation in the volume of accidents experienced. The outstanding difference seems to be in organized safety effort. With few or no exceptions the plants which have landed in the perfect record class have maintained their safety activities at their accustomed high level of efficiency or somewhere near that level. They have succeeded, in spite of difficulties, in keeping safety first in the mind of each individual worker. In most cases, plants which gravitated to the bottom of the pile are those which reduced or abandoned their safety programs "for the time being." None of these plants realized the probability of a violent reaction; many believed that they could travel along on their momentum. Most of them felt that they had little choice in what to do. Many of these plants have been and still are relying on safety organizations that would be utterly insufficient even under much more favorable circumstances.

In 1944 cement plants within Portland Cement Association membership suffered a total of 335 chargeable accidents, 63 per cent. of which occurred in the lowest 25 per cent. of the mills. The 21 plants with the poorest records for the year reported 166 accidents (one more than half the year's total), while the 109 plants occupying the upper end of the list reported the remaining 164 accidents.

In the top 25 per cent. of the

We'll back up overseas buddies, Work Safely

AGREE? SIGN UP —

Poster used by the Portland Cement Assn. to promote its safety program.

plants are included 26 winners of the P.C.A. trophy for 1944, five of which had completed 1,000 days of safe operation and 4 of which had completed over 2,000 days. Two of the latter have since completed over 3,000 days without mishaps. Some eight of the above plants have suffered no accidents since Pearl Harbor.

do also. The committee decided, therefore, that no average frequency rate for the industry of over 4 accidents per million man-hours would be acceptable in 1945, although the best previous record ever achieved was 4.26.

Similarly, the analysis of accident severity made by the committee showed that in 1943, when the aver-

COMPARISON OF INDUSTRY ACCIDENT STATISTICS — 1943-1944

	1943	1944	Increase (+) or Decrease (—) in 1944
Number of cement plants reporting	130	129	
Total accidents causing disability or death	395	335	—15.2%
Total man-hours of exposure	50,709,612	39,564,297	—22. %
Accident frequency rate	7.78	8.47	+ 9%
Accident severity rate	2.26	2.96	+31%

(The accident frequency rate for 1944 (8.47) is the highest cement-industry rate for many years and almost twice the all-time low frequency rate of 4.26 in 1939.)

	1943		1944	
	Chargeable Accidents	Days	Chargeable Accidents	Days
Fatalities	13	78,000 charged	15	90,000 charged
Permanent disability	33	25,356 charged	28	16,505 charged
Temporary disability	349	11,540 lost	292	10,722 lost
Total chargeable accidents	395	114,896	335	117,227
Total days				

(Notice the predominence of severity charges due to fatal accidents. The extra time charge of 12,000 days for two additional fatalities suffered in 1944 exceeded the entire time lost in 349 temporary-disability accidents in 1943 (11,540 days) or that lost in the 292 temporary-disability accidents in 1942 (10,722 days.)

Great Improvement Possible The situation indicated in the above figures led the Portland Cement Association's Committee on Accident Prevention and Insurance to the conclusion that improvement was not only imperative but by no means beyond the ability of the cement industry to achieve. After careful consideration this very dynamic group of leaders determined to "sell" the industry on a victory safety program for 1945. The response by industry management and operating men was immediate and about 99.44 per cent. complete.

The committee's analysis showed, for example, that although the industry's 1943 frequency rate was 7.78, 35 cement plants operating that year had a frequency of less than 1.00, 38 had a frequency rate under 2.00 and 60 had a frequency of less than 4.00. These 60 plants were in no wise exceptional, so, the committee reasoned very logically that what this group of 60 organizations could do, the remaining 70 plants in the reporting group could

age severity rate was 2.26, 102 plants achieved an accident severity of less than 1.00 day lost per 1000 man-hours, while only 28 reporting plants had a higher rate. Moreover, 107 plants achieved a severity rate of less than 2.00 and only 23 plants were above that figure. Therefore the committee concluded reasonably that an industry accident severity of 2.00 was within fairly easy reach for 1945, although the industry's best previous severity rate was 2.02.

Betterment Already Evident The spirit of coöperation that was forthcoming when the Victory Program for 1945 was announced may be judged from the fact that, based upon the best statistics and estimates available, the reversal of accident trends in cement mills since January 1, now appears to exceed gains for any comparable period.

Accident reports from member mills reaching the Portland Cement Association from January to June 15 of 1944 and 1945 compare as follows:

	5½ Months of 1944 Chargeable Accidents	Days
Fatalities	9	54,000 charged
Permanent disabilities	11	12,850 charged
Temporary disabilities	120	2,861 lost
Total chargeable accidents	140	
Total days		69,711

	5½ Months of 1945 Chargeable Accidents	Days
Fatalities	3	18,000 charged
Permanent disabilities	9	7,900 charged
Temporary disabilities	86	3,927 lost
Total chargeable accidents	98	
Total days		29,827

70.0	per cent. as many accidents were reported for the 1945 as for the 1944 period.
42.8	per cent. as many days were lost during the 1945 as during the 1944 period.
33.3	per cent. as many fatalities were reported in the 1945 as in the 1944 period.
81.8	per cent. as many permanent disabilities were reported in the 1945 as in the 1944 period.
71.7	per cent. as many temporary disability accidents were reported in the 1945 as in the 1944 period.
114.7	per cent, as many clear records were reported in the 1945 as in the 1944 period.
51	plants reported fewer accidents in the 1945 period as in the 1944 period.
35	plants reported more accidents in the 1945 period as in the 1944 period.
43	plants reported no accidents during either period.
68	plants appeared as potential 1944 trophy winners on June 14, 1944.
78	plants appeared as potential 1945 trophy winners on June 15, 1945.

Unfortunately, man-hour figures are not available for these periods, making it impossible to compare frequency or severity rates. According to the latest available reports by the U. S. Bureau of Mines, 18,147,000 barrels of cement was produced in the United States during the first quarter of 1944 and 18,148,000 barrels in the first quarter of 1945, from which it may be assumed that the man-hours of exposure in reporting plants did not vary greatly for these two first-quarter periods. If we compare the accidents reported for the first quarter of 1945 with the first quarter of 1944 we obtain the following astonishing results:

	First Quarter of 1944 Chargeable Accidents	Days
Fatalities	5	30,000 charged
Permanent disabilities	5	5,750 charged
Temporary disabilities	75	2,767 lost
Total chargeable accidents	85	
Total days		38,517

	First Quarter of 1945 Chargeable Accidents	Days
Fatalities	0	0
Permanent disabilities	3	1,000 charged
Temporary disabilities	49	728 lost
Total chargeable accidents	52	
Total days		1,728

Readers should be able to gather from the foregoing that something very interesting is going on safety-wise in the cement plants of America. Safety achievement is very largely a thing of the spirit. John W. Mather, industrial relations manager of the Lone Star Cement Corporation, said recently: "Success in

(*Continued on page* 87)

Florida's Only Hard-Rock Phosphate Plant in Operation Near Dunnellen

General view of plant showing skip car feeding matrix to plant at extreme right, and finished product being loaded into open-top car on extreme left.

another ON THE SPOT report

THE only plant in the state of Florida now producing high-grade hard-rock phosphate started operations in January of this year near Dunnellen. It is operated jointly by C. & J. Camp, Inc., of Ocala, Florida, and J. Buttgenbach Company, Lakeland, Florida. Much of the new plant's equipment came from Camp's Felicia Mines, where the phosphate deposit became depleted some months ago. In addition, however, to the reclaimed equipment from Felicia, a considerable amount of new machinery has been installed at the Dunnellen site, to make this plant one of the most modern and efficient operations in the phosphate fields.

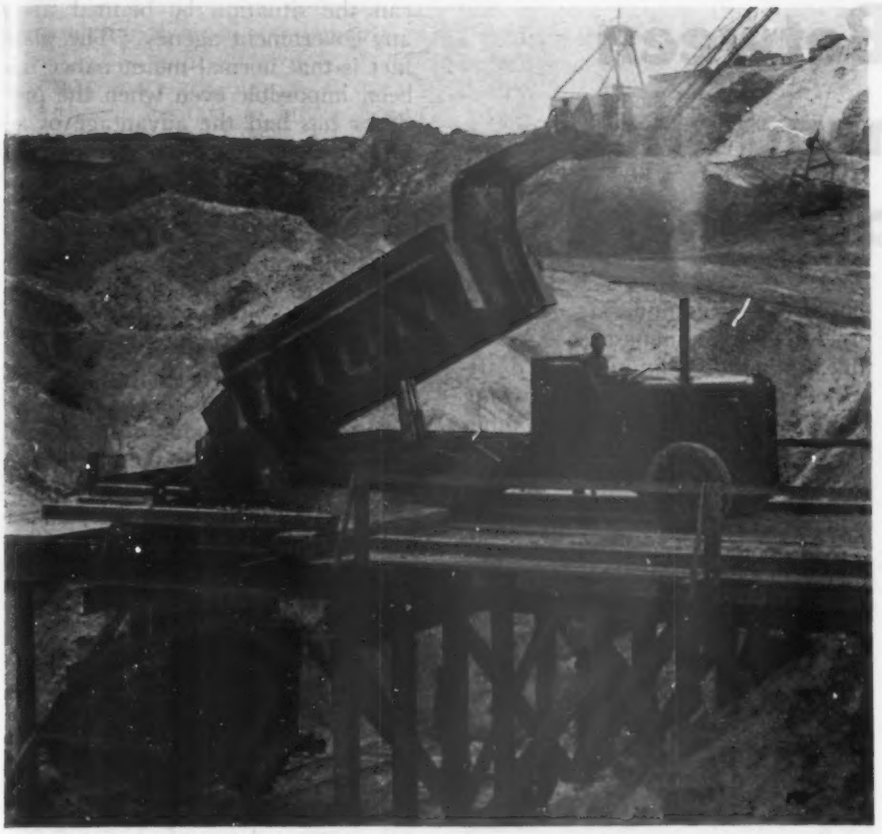
The Dunnellen deposit—which was worked by Camp during World War I—is a sand-clay phosphate-rock matrix. Although most of the material runs below 10 or 12 inches in size, particles range from grain-size to boulders weighing many tons. Hard-rock phosphate is almost never encountered in the large deposits which characterize the pebble fields; at Dunnellen the pits vary in size from 2 to 20 acres, with the average probably not exceeding 8 acres.

The overburden, which averages 50 feet or more, is stripped hydraulically, and some mud-capping is done to reduce large boulders—*i. e.*, those over 2 feet. A 3 cubic-yard Monighan drag line, electric with Ward-Leonard control, loads the matrix into Linn Halftracks with 8-cubic-yard bodies, which haul the material to a point in the pit about 700 feet from the washer, where it is dumped into 7-cubic-yard skip cars. The skip cars are drawn by cable from a point about 80 feet below ground level to the plant. From 1200 to 1700 cubic yards of matrix is fed to the plant in a 10-hour day.

By WILLIAM M. AVERY

The skip cars are dumped into a steel hopper at the top of the plant—about 50 feet above ground level—and the material is hydraulicked by a small gun as it flows from the hopper onto a roll grizzly which has push botton start-and-stop control. The grizzly was built by the Maddox Foundry and Machine Works, and consists of 13 corrugated rolls on a 20-degree slope followed by 6 smooth rolls on a 10-degree slope; the speed increases gradually from 5 r. p. m. at the first roll to 10 r. p. m. at the bottom roll. With the exception of reject material, the oversize travels the full length of the grizzly and drops into a 24-by 54-inch Maddox roll crusher set at 7 inches; reject oversize is pulled manually from

Looking down incline into pit, showing double track, merging into single track on pit floor. Three-cubic-yard dragline in distance.



Dragline loads matrix into 8-cubic-yard halftracks. These haul material to an elevated platform where the 7-cubic-yard skip cars are loaded.

the smooth rolls onto a drag conveyor which discharges into 4-cubic-yard Koehring Dumptors for hauling to waste dumps.

The throughs from the grizzly and the crushed material are rejoined and chuted into a Maddox 7-by 14-foot rotary screen which has 1¼-inch openings. The oversize — plus 1¼ inch—drops on a 36-inch by 50-foot belt conveyor, where it is hand-picked to remove refuse rock and clay before being conveyed and fed to two 24-by 36-inch Maddox roll crushers set at 3 inches. The minus 1¼-inch rock drops into a tank from which it is pumped by a Georgia Iron Works 8-inch centrifugal pump to an Allis-Chalmers 4-by 12-foot double-deck vibrating screen. This is primarily a dewatering screen, with ⅜-inch by 1-inch punched plate on the top deck to reduce the wear on the 10-mesh bottom deck.

The oversize from the screen and the material from the two crushers flow into two McLanahan & Stone 12-inch by 30-foot log washers, set end to end so that the discharge from the upper unit feeds the lower. To assure the maintenance of a heavy bed of material in the washers, the speed of the logs may be varied from the minimum of 20 to the maximum of 35 r. p. m. At present the pitch of the machines is fixed at 2¼ inches per foot, but the company plans in the near future to make the pitch adjustable. It is believed that the additional control thus obtained will increase the capacity of the washers somewhat and result in more uniform quality.

A 7-by 12-foot Maddox double-shell rotary screen sizes the material discharged from the log washers. The slotted openings of the outer and inner shells of the screen are 1/16-by 1-inch and ⅜-by 1-inch respectively. The oversize rock passes over a 36-inch by 35-foot belt conveyor, where it is hand picked to remove refuse, clay balls, and flint and lime rock. The final reduction of the rock is made by a Maddox 24-by 36-inch fluted roll crusher set at 1½ inches, and the finished product runs out on an 18-inch by 100-foot belt conveyor which discharges into the larger of two concrete loading bins. The minus-⅜-inch rock from the double-shell screen is loaded into the adjoining bin by belt conveyor without additional crushing.

Speed of the 30-foot log washer can be varied from 20 to 35 r.p.m. to maintain a heavy bed of material.

The overflow from the log washers, which contains particles up to ¼-inch, the undersize from the 4-by 12-foot vibrating screen, mentioned above, and the throughs from the outer shell of the 7-by 12-foot revolving screen go to a Dorr 20-foot-diameter hydro-separator. The overflow from this hydro-separator goes directly to waste, which flows by gravity to an old pit. The undersize from the 20-foot separator is pumped with a 6-inch Georgia Iron Works pump to a single-deck screen with 8-mesh cloth, located directly over the second log so that the plus

(*Continued on page* 87)

View of the 20-foot diameter hydro-separator.

Lag Widens Between Agstone Demand and Supply of Equipment

another P&Q exclusive

NO marked improvement in the supply of equipment for the production of agricultural limestone is in sight in the immediate future or for some time following the close of hostilities in Europe. W.P.B. Chairman Krug has said recently that the supply of iron and steel is as critical as at any time during the war. As a result, the manufacture of new equipment for producing agricultural limestone will not be possible in sufficient volume. It can not compete against high-priority war programs for raw materials. Used equipment is not the answer. There is none to be had at present.

At the same time the industry must supply the greatest demands on record. If the requirements are to be met, the production of agricultural limestone in 1945 and 1946 must reach higher levels than ever before achieved. The demand for new equipment and repair parts will follow the production curve as it goes upward. The present situation actually has been developing over a period of years, being the natural result of forces which were put into operation a decade ago. Here is how it came about.

To grasp the picture one must study the growth of this part of the crushed-stone and lime producer's operations. Prior to the A.A.A. program inaugurated about ten years ago there was a well-defined relation between the production of agricultural lime and burned lime. The rapid increase in the use of agricultural limestone resulting from this subsidy is shown in the accompanying table.

Early in the war the War Production Board tightened up severely on the producers of aglime by extending higher priorities to other types of mining operations. This meant that aglime producers used their mining machinery to the limit and many small operators had to close their plants when their equipment wore out. The smaller operators could not be convinced that the war program would employ all the manufacturing facilities for a long period and they did not purchase the available used equipment.

It now develops that materials essential to the manufacture of aglime processing equipment are so scarce that production is limited. The drafting of labor from the manufacturing plants and the labor policies of other government agencies have slowed the production of mining equipment and put the time when it will be available for aglime production farther and farther into the future.

AGRICULTURAL LIME AND LIMESTONE USED ON U. S. FARMS 1911-1943

(Sources: U. S. Bureau of Mines for 1911 to 1928, National Lime Association Annual Survey for 1929 to 1943.)

Year	Lime (tons)	Limestone (tons)	Total (tons)
1911	596,664	174,290	770,954
1912	604,607	200,000	804,607
1913	590,229	408,627	998,856
1914	684,348	615,197	1,299,545
1915	673,260	810,399	1,483,659
1916	613,564	1,066,376	1,679,940
1917	488,297	1,040,248	1,528,545
1918	391,047	1,091,918	1,482,965
1919	438,632	1,392,914	1,831,546
1920	351,851	1,364,260	1,716,111
1921	284,722	1,311,520	1,596,242
1922	277,726	1,195,000	1,467,726
1923	240,551	1,278,770	1,519,321
1924	248,336	1,352,600	1,600,936
1925	298,976	1,954,480	2,253,456
1926	297,010	1,850,620	2,147,630
1927	322,893	2,206,470	2,529,363
1928	333,910	2,186,870	2,520,780
1929	335,369	3,301,026	3,636,395
1930	351,975	2,962,641	3,314,615
1931	310,214	2,064,025	2,374,239
1932	243,205	1,381,258	1,624,463
1933	233,991	1,180,943	1,414,934
1934	218,578	1,772,999	1,991,577
1935	295,590	2,371,927	2,667,517
1936	337,013	5,567,432	5,904,445
1937	395,097	5,772,588	6,169,685
1938	376,327	6,029,847	6,406,174
1939	341,908	7,132,823	7,474,731
1940	407,034	12,203,946	12,610,980
1941	415,616	14,321,490	14,737,106
1942	378,863	16,302,354	16,681,217
1943	442,651	16,515,352	16,958,003

Used equipment is not the answer. A study of the used equipment now available will startle any student of this problem. Few people not directly interested in the second-hand equipment business appreciate the volume of used equipment that has been rehabilitated and shipped out of the United States.

Producers are in a tough spot. The increased demands must be met with machinery that has been operated at capacity for five years without usual maintenance. This is not a criticism of plant operators nor can the situation be blamed upon any government agency. The plain fact is that normal maintenance has been impossible even when the producer has had the advantage of an undisturbed pre-war plant force of well-trained, careful and efficient operators. Replacement parts have not been available when needed.

As the war closes many operators will face the problem of the complete replacement of their present facilities. Economic and operating conditions will require that the plants be established at new locations, because of the exhaustion of the faces, because of excessive production costs and for a score of other minor reasons. For this reason the demand for machinery of all types will increase and producers of aglime will be forced to compete not only with other members of their own industry but with all industries for their share of the available equipment.

Other problems will have to be considered in addition to that of equipment, for example, that of transportation. As a general rule, the production of lime is carried on near congested manufacturing areas. This means that when car shortages on the railroads develop, the aglime shipper will be forced into the background because his product is a less profitable haul for the carriers. Probably of greater importance is the fact that other products may be considered more essential to the present economy. The shortage of railroad cars, which has been quite openly discussed by the Office of Defense Transportation, is well on the way and will probably arrive sooner than anyone outside the railroad industry expects. Under the conditions in the immediate future, which are already taking shape, the small producer capable of serving the local demand by truck will find that his facilities must supply a greater and greater demand.

Under these conditions, which are none too bright, the question of what can be done naturally arises. No operator should neglect to maintain his equipment in the best possible condition. No operator *should* neglect to secure and maintain the best possible inventory of repair parts. The evils of poor maintenance are cumulative. A worn bearing will throw a shaft out of alignment, which is not only bad for the shaft but also causes the bearing to suffer.

An operator should anticipate his requirements for replacements of complete units as far in advance as possible. Only in this way can he be certain that he will get his ma-

By JAMES E. BACON
Technical Counselor

chinery in competition with other demands for the same equipment.

Since the difficulties of securing new machinery are so great, no operator should hesitate to buy a good piece of used equipment. All members of the industry should remember that the foreign demand for any type of used crushing and hauling equipment is very active and is almost unlimited. Export permits for used equipment have been easy to secure. Even now there is no restraining regulation that interferes with the purchase by foreign interests of the machinery that the aglime producer must have. Knowing this situation, it is easily possible to prevent the further drain of used equipment from the domestic market.

Some producers have been procrastinating in the belief that manufacturing restrictions would ease sufficiently to enable them to secure new and up-to-date models or that surplus government equipment would come on the market to help them out. Both ideas seem farfetched. Government lists of surplus equipment being offered to dealers show a marked lack of modern units and reports from dealers are that the equipment offered requires many repair parts and much labor before it can be operated efficiently.

Some producers seem to think that they will be able to get by immediately after the war by the purchase of equipment used by combat units. The value of equipment offered from this source will probably be disappointing, if past experience is a criterion.

Another excellent step that plant operators can take against future disappointments is to study the flow of material through their plants. If it is possible, a closed circuit should be achieved. By so doing the acceptable material would be screened out as it leaves the crusher and only the oversize recirculated, reducing the total load on the grinding equipment. All crushers and screens should be checked to see that each one is doing its full share of the work and that no one is overloaded. These are but a few of the changes that could be made which would result in lowering not only the cost of maintenance but also the over-all operating cost.

In view of the imminent possibility of transportation difficulties on the railroads, studies of other possible means of distributing aglime should be undertaken. Local demands can probably be handled by trucks. Present indications are that the supply of trucks and truck tires will improve before the supply of railroad cars. Water transportation may be a solution in some cases. The Navy has already released barges that might be adapted to the needs of the industry.

Last but not least, producers of aglime should seize every possible opportunity to create a stock pile of finished material. By so doing they will put themselves into a position to take advantage of every fortunate circumstance that may come their way.

Florida Phosphate *(from page 85)*

8-mesh material drops into the log. The throughs from this screen go to a 25-foot dewatering drag, which overflows to waste, and the drag product is pumped to a 5-pocket Dorr sizer. The overflow and the 5th pocket-product go to waste and the products from pockets 1, 2, 3 and 4 go to a single deck 4-by 12-foot screen fitted with 14-mesh cloth. The undersize from the screen goes to waste while the oversize goes to a 25-foot Dorr rake classifier. From

Rock from the mine is hydraulicked by a small gun as it passes over a roll grizzly.

the classifier the material may be mixed with the regular product or placed in storage for future use. It is quite probable that a drying and grinding plant will be built for reducing this material to 90 per cent. through 200 mesh for direct application to the soil. Also, it is probable that equipment will be installed in the near future for recovering minus 14 - mesh plus 35 mesh - material, which will be dried and ground for direct application.

All shipments are made in open-top cars which are loaded by means of a 30-inch conveyor located in a tunnel under the loading bins. The finished product, which runs from 76 to 82 per cent. bone phosphate of lime, is shipped to Fernandina, Florida, 27 miles north of Jacksonville, where it is dried in rotary driers and placed in dry storage to await overseas shipment.

One of the 4-cubic-yard dump trucks used for hauling refuse rock from the plant.

It is expected that production at the Dunnellen plant will average about 40 tons per hour, although the wide variation in the grade of matrix available will at times cause the output to drop as low as 10 tons per hour or to increase to the maximum of, perhaps, 60 tons per hour. An average of 4 cubic yards of matrix must be handled to produce 1 ton of finished product.

The plant works a single-shift 10-hour day and employs about 70 men normally. T. D. Felton is general superintendent and J. F. Hedick is plant superintendent.

Safety Program *(from page 83)*

preventing accidents requires the coördination of heart, head and hand. Unless the heart is in it, the head will not lead and unless the head leads, the hand can not serve."

On June 1, all the member plants of the Portland Cement Association accepted the invitation of the P.C.A. Committee on Accident Prevention to join in the Nineteenth June No-Accident Campaign. This campaign is being sponsored by the chief executives of the cement companies, each of whom has enrolled personally and given his personal pledge. The campaign is being pushed to a successful finish by teams of men in every plant, each dedicating its efforts to the men of its own plant who are serving at the front. No comparable effort has been made in the cement plants in years.

June, the peak month for accident hazards in the manufacture of cement, seems destined this year to set some new records and to provide momentum for the months ahead.

Among the materials which the War Production Board expects will remain in short supply are mica, talc, potach and zinc oxide.

National Industrial Sand Producers Consider Major Current Problems

another ON THE SPOT report

ATTRACTED by an agenda that covered the problems of greatest interest to their industry, 35 representatives of industrial-sand producing companies met in New York to attend the tenth annual meeting of the National Industrial Sand Association, held at the Hotel New Yorker, May 23 and 24.

President T. C. Matthews, who presided at the first day's sessions, spoke briefly of the industry's outstanding success in meeting the demands that had been placed upon it by the war and far exceeded anything previously known. Many producers, he said, had done more in support of the government's war activities than duty required. He praised the work done by the association's staff in tirelessly watching the industry's interests and in keeping the membership informed of new developments affecting industrial-sand producers.

Treasurer George A. Thornton's report on the financial status of the association was adopted after careful consideration by those present. It showed the results of 12 months' operation under the plan for strengthening the organization's financial position adopted a year ago.

The Committee on Nominations, headed by Russell G. Hay, proposed T. C. Matthews, A. Y. Gregory and George A. Thornton for consideration as candidates for re-election to the offices of president, vice-president and treasurer, respectively, and the re-election of the board of directors, which includes, in addition to the officers, Hamilton Allport, E. M. Durstine, Stirling N. Farmer, C. M. Hardy, W. J. Muhlitner and Harry F. Spier. All were unanimously elected to serve for another year.

Compensation Insurance Rates Theodore C. Waters, the association's counsel, presented a detailed report on the negotiations that had been conducted with the National Council on Compensation Insurance in an effort to bring about a reduction in the insurance rates covering silicosis. At the 1944 meeting, the association's officers and counsel were authorized to continue their efforts with the council for a reduction in the workmen's compensation insurance rates applicable to silicosis. According to the speaker, one insurance-company official, among a group of similar executives with whom a conference was held, said that the time was propitious for a review and reduction of such rates. The rate-making authorities of some insurance companies are now studying the subject.

As an example of the effects of recent legislation dealing with workmen's compensation, Mr. Waters cited the case of an industrial-sand producer, whose base workmen's compensation rate had been $3.40 per $100 of pay roll but was raised to $5.45 by a Virginia law which became effective in 1944.

Occupational Disease Legislation Mr. Waters then reviewed state legislation and court decisions in considerable detail. He said that 46 state legislatures had met and hundreds of bills affecting industrial-sand producers had been introduced. Occupational-disease statutes are here to stay, in his opinion, and it is significant that none of the bills introduced sought the repeal of existing laws. He mentioned Iowa and Tennessee as examples of states in which bills had been introduced but had not been enacted.

Colorado, Maine and New Mexico enacted new occupational disease compensation laws.

The Colorado law, effective January 1, 1946, lists 22 occupational diseases including silicosis. It provides compensation only for death or total disability, by which is meant total incapacity for performing any occupation for profit.

The Maine law, which will become effective January 1, 1946, specifically excludes dust diseases from its compensation provisions.

Enumerated in the New Mexico law are 29 diseases including silicosis and asbestosis. Its effective date is July 9, 1945. In order to qualify for compensation, the disability must be total. In the case of dust diseases, compensation starts at $800 in the month in which the law becomes effective and increases $70 monthly until the maximum benefit of $5,000 is reached.

Effective June 5, 1945, the West Virginia workmen's compensation law was amended to eliminate separate elective provisions relating to silicosis compensation, thus making compensation compulsory. By its provisions, first-stage benefits have been raised from $500 to $800 and second-stage benefits from $1,000 to $1,600. The old provision requiring evidence of the tubercle bacillus in the sputum of the claimant in third-stage silicosis has been replaced by the requirement that he must have silicosis accompanied by active tuberculosis of the lungs, resulting in permanent total disability. The minimum benefit payments for temporary total disability have been increased from $8 to $10 weekly and the maximum benefit payments from $16 to $18.

In the case of Pennsylvania, Mr. Waters thought that amendments providing larger benefits than those that were in effect would probably become law. It has been proposed that the maximum benefit for death or partial disability due to silicosis be increased from $3,600 to $4,000 and that for total disability from $7,500 to $10,000.

In New Jersey, an amendment which added dermatitis to the list of compensable diseases became effective January 1, 1945. Five new diseases are listed as compensable in the amendment made to the Maryland law.

Mr. Waters told his listeners that it will be good business in the future to do everything possible to bring occupational-disease hazards under control.

Occupational Health Education Dr. Raymond Hussey, dean, School of Occupational Health, Wayne University, Detroit, told of the ideas and events that had led to the establishment of the school which he heads and of the program he has undertaken there. He asserted that every member of corporate management must be concerned about the health of its workers, not because of humaneness or kindness but because of efficiency. Prior to organizing the school at Wayne, Dr. Hussey had developed an occupational health program for the American Medical Association, whose Council on Education and Council on Health held a joint meeting a year ago to discuss and promote the idea of industrial health. Since that time, Dr.

Hussey organized the School of Occupational Health.

The speaker asserted that, if more time and effort had been spent in the field of human health and human relationships, many of our present conditions would not exist, and if industry had devoted adequate attention to these problems, much misery and litigation would have been avoided. Many of the difficulties arising under workmen's compensation acts are due, in Dr. Hussey's opinion, to lack of knowledge of silicosis.

The school organized by the speaker will train men for practice in industrial medicine. The curriculum will embrace: (1) Non-clinical work in the field of occupational preventive medicine, (2) occupational preventive engineering, (3) occupational health administration, (4) occupational health economics, and (5) workmen's compensation.

Handling of the health aspects of industrial production, according to Dr. Hussey, is an increasingly important need of management. Industry has neglected the health problems of production. Industrialists should assume the responsibility for seeking, knowing and applying sound health principles, and not leave it to government or organized labor, he said.

Following the first day's lunch, those present were shown a colored motion picture called *Plane Facts About Glass,* displayed through the courtesy of the Libbey-Owens-Ford Glass Company. The picture was produced to inform the public of the role played by glass in war and portrayed the processes and machinery employed in glass production.

Research Hamilton Allport, chairman of the National Industrial Sand Association's Research Committee, warned his audience of the dangers of complacency at a time when technical advance may be more important than ever before. He thought that the Research Committee might be divided into three subcommittees: (1) Product Research; (2) Sales Research; and (3) Production Research, which, he explained, would include industrial health.

In speaking of research matters of interest to the association, Stanton Walker, the association's consulting engineer, told briefly of the work being done by the Special Advisory Committee on Bonded Sands, appointed by President Matthews at the fall meeting of 1944 to study the possibility of substituting an end-use test for strength tests made without consideration of other properties. It has been felt that the American Foundrymen's Association tests, which are based on strength only, are of no value unless they are accepted by sand manufacturers. A division of the Department of Commerce is setting up classifications for commodities, including such items as foundry sand. Sands are classified by the department according to sieve sizes.

Returning Veterans Executive Secretary V. P. Ahearn reviewed some of the conditions surrounding the employment of war veterans, and said that employers must recognize and discharge their responsibilities toward returning service men, some of whom may be physically or mentally handicapped. The industrial-sand industry must, he said, do its part of the nation's job of providing them with dignified employment at reasonable wages. If private industry takes the position that it can not assume the risks of re-employment, government (federal or state) will provide employment.

He reminded his hearers that a veteran re-employed shall be considered as having been on furlough and as entitled to all the benefits, including insurance, that would have accrued to him had he not been away. Furthermore, a re-employed veteran must not be discharged without cause for one year after his re-employment.

The returning veteran who meets the requirements of the Selective Service System Law must be given employment, even if his successor must be discharged, Mr. Ahearn pointed out. He has not only seniority rights but the right to his old job, or, if he is unable to perform the duties of that position or to qualify for an upgraded job, to another position equal in seniority, status and pay to the one which he gave up to go into service. The Selective Service System Law takes precedence over private agreements, such as contracts with labor unions, and a re-employed returning veteran would not be required to join a union organized, or to comply with the terms of a union contract made, since he left to serve in the war.

Availability of Materials The second day's sessions opened with Vice-President Gregory presiding. At his request, Mr. Ahearn discussed the availability of materials and supplies needed by the industry, calling attention to the fact that every producer's M.R.O. quota for each quarter of 1945 is 120 per cent. of his purchases in the corresponding quarter of 1943, whether covered by priorities or not. Applications for M.R.O. materials can be filed through the Washington office of the association, he said.

Since V-E Day, the War Production Board has been eager to get civilian industry into production, and, as a result, "replacement" is no longer the sole test by which an application made on Form W.P.B. 1319 will be judged. However, Mr. Ahearn pointed out, the application should state that the desired equipment is needed to replace outworn or obsolete equipment.

In the second quarter of 1945 industry's use of steel was cut 25 per cent.; in the third quarter this material probably will be purchasable under a 140-per cent. factor.

Some capital items, such as tractors, shovels, cranes and drag lines, are still critical.

Repair Parts Mr. Ahearn referred to the change made about a week before the meeting in Limitation Order L-192, which originally cut into Order P-56, designed for the mining industry. As a result of the amendment mentioned by him, L-192 no longer applies to the mining industry with respect to repair parts, although it still controls a few capital items.

Trucks may be less difficult to get than they have been. Applications, Mr. Ahearn reminded his audience, should be filed with the local office of the Office of Defense Transportation, and it would be wise to enlist the aid of the nearest field office of the Mining Division of the W.P.B.

An early improvement in the situation with respect to truck repair parts is expected.

The O.D.T., in a letter to the association in regard to the conservation of truck tires, said there was little hope for relief in the near future. It is still imperative, therefore, that tires be regularly and frequently inspected for cuts and signs of wear, Mr. Ahearn said.

The industrial-sand industry has not been required to file its prices, he stated. March, 1942, ceiling prices govern present-day prices on the same commodities, or on commodities of the same class, sold to customers of the same class. New plants opened since that time must have their prices approved by the Office of Price Administration under M.P.R. 188, and the same requirement applies to a new product not made in March, 1942. Producers who need increases in their ceiling prices must file their pleas with the O.P.A. and must show that a refusal of relief would produce a shortage

of material affecting the public interest.

Box-Car Shortage The shortage of box cars continues serious, accordign to Mr. Ahearn. Immobilization of this type of equipment in the eastern states, the coal shortage, the grain movement, the increasing number of worn-out cars, and the greatest movement of freight in history are contributing factors. There may be no relief for a year. Answers to questions asked of members revealed considerable variety in the conditions prevailing in different sections of the country. Thus, the situation in Ohio, Illinois and southern Indiana was described by producers in those areas as critical. No shortage was reported for Michigan, Wisconsin or Missouri, and in Pennsylvania no trouble was experienced until the grain movement began. The supply of cars is likely to be adversely affected by the transfer of military forces and supplies from the eastern seaboard to the western coast.

With respect to the man-power situation, Mr. Ahearn stated that existing controls may be lifted in Group 3 and Group 4 areas and retained in those in Groups 1 and 2. The industrial-sand industry is on the War Manpower Commission's Revised List of Essential Activities.

Despite letters sent to industrial-sand producers, the industry is still exempt from renegotiation, Mr. Ahearn said. A producer of industrial sand should be concerned with the problems of renegotiation only if he makes other products which are subject to renegotiation regulations.

Surplus Government Property Mr. Ahearn pointed out some of the advantages that can be gained by establishing relations with a reputable machinery dealer for the purchase of surplus government property as distribution of such equipment will be made only through dealers. Such a representative can watch for announcements of public sales of the type of equipment needed. Order W.P.R. 134 sets ceiling prices on such equipment, allowing a price equal to 85 per cent. of the list price, if the equipment has been restored to first-class condition. If the equipment has not been reconditioned, the price must not exceed 55 per cent. of the list price.

Truck Owner-Drivers The Bureau of Internal Revenue has heretofore looked upon truck owner-drivers as employees of the companies they serve rather than as independent contractors. If they are owner-drivers, the producer served by them must pay the wages required by the Fair Labor Standards Act and make the proper Social Security deductions (beginning in 1936 plus 6 per cent. interest), these deductions being based on that portion of the hiring price which represents the labor cost of the driver. If the owner-drivers are independent contractors, the producer whom they serve must pay the 3-per cent. transportation tax to the point where he relinquishes control of the material hauled. Wearing the producing company's uniform, having the producer's name on his truck, performing for the producer any work in addition to driving and reporting at required hours are looked upon by the Bureau of Internal Revenue as evidence of the existence of an employment relationship. The speaker reminded his listeners that the Fair Labor Standards Act—commonly known as the wage-and-hour law—requires that employment records be kept according to prescribed forms.

Mr. Ahearn mentioned as likely to be overlooked other provisions of that law, such as the minimum hourly rate of 40 cents, the requirement that overtime beyond 40 hours in a given week be paid at 1½ times the straight hourly rate, that no employee shall be less than 16 years old, and that no employees between the ages of 16 and 18 shall be engaged in hazardous occupations, such as truck-driving. The State of New York has recently reduced the permissible truck driver's age limit to 17 years.

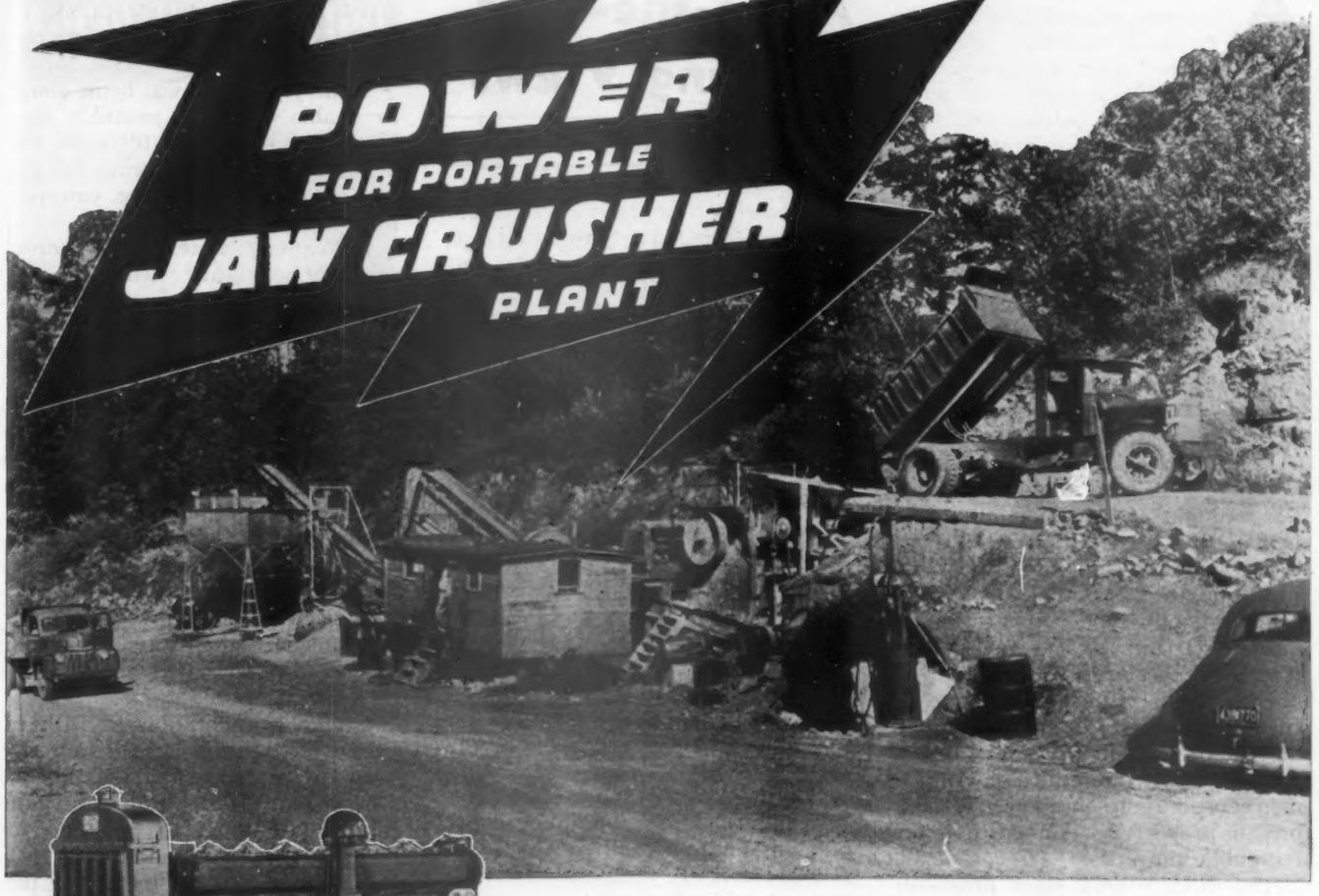
The report of the Committee on Proposed Revisions in Annual Reports of Bureau of Mines was presented by the chairman, A. Warsaw, but action on it was postponed until the next meeting.

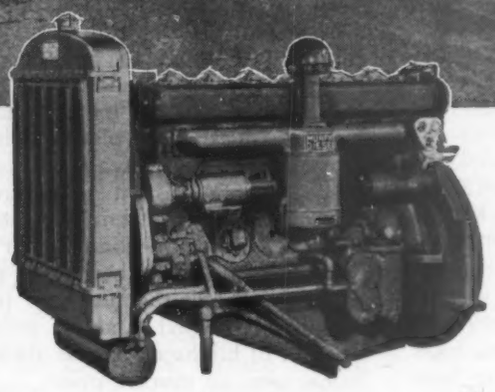
Russell G. Hay offered resolutions expressing sorrow for the deaths of Leslie M. Hansen and Wilbert Bivins which had occurred since the previous meeting. Mr. Hansen was chosen president at the association's first meeting and he contributed in large measure to the organization's success. He was president of the Industrial Silica Company when he died. Mr. Bivins was president of the National Pulverizing Company. Another resolution expressing the association's appreciation of the sympathetic and understanding attitude of the Mining Division toward the industrial-sand industry was proposed. All the resolutions were unanimously adopted.

The following members of the association and its staff and representatives of the trade press were present:

Ahearn (V. P.), National Industrial Sand Association, Washington, D. C.
Allport (Hamilton) Standard Silica Corp., Chicago.
Andrews (Earle T.), Pennsylvania Glass Sand Corp., Mt. Union, Pa.
Bergs (James B.), Pioneer Silica Products Co., St. Louis.
Bos (N. C.), Producer's Core Sand Corp., Michigan City, Ind. and John N. Bos Sand Co., Chicago.
Cable (J. S.), Minnesota Mining & Mfg. Co., Akron, O.
Cleary (J. J.), Sand Products Co., Cleveland, O.
Coxey, Jr. (J. S.), Industrial Silica Corp., Youngstown, O.
Craig (David L.), South Jersey Sand Co., Dividing Creek, N. J.
Cronenweth (John D.), Great Lakes Foundry Sand Co., Detroit.
Dougherty (E. H.), Taggart & Co., Philadelphia.
Gill (Louis), George F. Pettinos, Inc., Philadelphia.
Durstine (E. M.), Keene Sand & Glass Co., Columbus, O.
Farmer (A. N.), Sand Products Corp., Cleveland.
Farmer (Stirling N.), Sand Products Corp., Cleveland.
Forman (P. G.), Industrial Silica Corp., Youngstown, O.
Gregory (A. Y.), Whitehead Bros. Co., New York.
Hardy (C. M.), Houghland & Hardy, Evansville, Ind.
Hartmann (C. Bryant), George W. Bryant Core Sands, McConnellsville, N. Y.
Hay (Russell G.), Ayers Mineral Co., Zanesville, O.
Matthews (T. C.), Pennsylvania Glass Sand Corp., Lewistown, Pa.
Miller (Alfred J.), Whitehead Brothers Co., New York.
Muhlitner (William J.), Great Lakes Foundry Sand Co., Detroit.
Nordberg (Bror), *Rock Products*, Chicago.
Phillips (Stanley A.), *Pit and Quarry*, Chicago.
Putman (John T.), National Silica Company, Oregon, Ill.
Schlesinger (Arthur B.), New Jersey Pulverizing Co., New York.
Schneider (E. O.), Ottawa Silica Co., Ottawa, Ill.
Sherratt (Milliam), South Jersey Sand Co., Dividing Creek, N. J.
Spier (Harry F.), New Jersey Pulverizing Co., New York.
Strouss (Julius M.), Decker's Creek Sand Co., Morgantown, W. Va.
Tanzer (Arnold H.), New Jersey Pulverizing Co., New York.
Walker (Stanton), National Industrial Sand Association, Washington, D. C.
Warsaw (A.), Wedron Silica Co., Chicago.
Waters (Theodore C.), Baltimore, Md.
Wild (Norman B.), Crossman Co., South Amboy, N. J.
Williams (Howard J.), New Jersey Silica Sand Co., Millville, N. J.
Wilson (W. A.), *Pit and Quarry*, New York.
Woodward (W. H.), Ottawa Silica Co., Ottawa, Ill.
Wolf (Clarence R.), New Jersey Silica Sand Co., National Pulverizer Co., Millville, N. J.
Wolf (C. Franklin), New Jersey Silica Sand Co., Millville, N. J.

POWER FOR PORTABLE JAW CRUSHER PLANT





Model ME-6, 5¾ x 6½, 6 cyl., 160 H.P. Murphy Diesel, powering Universal Engineering Company's Portable Jaw Crusher, owned by Art Overgaard, Elroy, Wis.

MURPHY DIESELS give a good account of themselves wherever called upon to power machinery for the construction industry, because they are engineered for the rugged service demanded from rock crushers, hoists, sand and gravel plants, pumps, excavating and loading machines, locomotives, logging and lumber plants, mines, barges, tugs, work boats . . . for heavy electrical loads . . . and for other heavy-duty jobs which they do economically and well.

They are compact, relatively light in weight, simple in construction, with plenty of reserve power. Operating and maintenance costs are low . . . no premium-priced fuel required . . . more power, more profit are assured. Write for bulletin.

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More Power
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Engines: FROM 90 to 215 HP
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"FIELD-PROVEN *Power*"

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After-the-War Building Views

By BETHUNE JONES

A MAJOR post-war market for cement, aggregate and other building materials may be developed by state legislation designed to facilitate large-scale post-war investment of private and corporate funds in slum-clearance projects.

In view of growing opposition to an expansion of federal activities in the housing field, together with the possibility that a debt-laden federal government may not be able to pour huge amounts into slum clearance even if so inclined, the legislative efforts by the states to encourage private capital to tackle the job assume considerable significance.

Major redevelopment of blighted housing areas by private enterprise was brought a long step closer in Illinois by a recent Illinois Supreme Court decision upholding the constitutionality of that state's 1941 neighborhood-redevelopment corporation act. Expected to have a far-reaching effect on similar legislative moves in other states as well as in Illinois, the court's opinion held that the Illinois Legislature had properly designated to community-redevelopment corporations the power to take private property by eminent domain for public purposes.

The Illinois act's main provision gives privately-financed enterprises the right to bring condemnation proceedings to assemble sites for building projects. Corporations operating under the act, however, are subject to supervision of municipal commissions. The municipal body first determines what areas are to be classed as slum districts. A further limitation requires the private development corporation first to acquire 60 per cent. of its building site through private negotiation. The law provides that public supervision ceases after completion of the project. This provision, the court ruled, does not alter the fact that the property is taken for a public purpose.

"The taking of property for the purpose of elimination, redevelopment, and rebuilding of slum and blight areas," the Illinois court ruled, "meets all the requirements of a public use and public purposes within the principles of the law of eminent domain."

Additional legislative action to stimulate private financing of housing-redevelopment projects was expected in Illinois as a result of the court ruling. One such proposed move would liberalize restrictions on the investment of insurance-company funds in housing developments of the type planned under the 1941 act.

Meanwhile, the Illinois court decision was hailed in Minnesota as bolstering efforts to obtain the enactment of a similar law in that state, giving municipalities power to assemble building sites in blighted and other unproductive areas and to make them available to private enterprise for construction purposes. Minneapolis officials have given their support to such proposed legislation.

Similar legislative action was being sought at this writing in California. Governor Earl Warren, in his opening message to the California Legislature, called for urban redevelopment through exercise of the power of eminent domain to acquire title to blighted areas and slums to permit sound redevelopment by private enterprise.

Pointing out that many Ohio cities "are suffering from the killing effect of slum and blighted areas," Governor Frank P. Lausche told the Ohio Legislature: "Authority by statutory enactment should be granted to municipalities to exercise the power of eminent domain for the acquisition of land for slum-clearing purposes."

Being considered at this writing by Detroit officials, for introduction in the Michigan Legislature, were three amendments to housing laws which would grant tax subsidies; provide land through condemnation for private housing; establish, principally through revenue bonds, public-housing projects; and permit the city to retain large sections for park and other public purposes not subject to taxation as part of the housing projects.

In Indiana a state law was being sought to encourage private enterprise to undertake the rehabilitation of blighted housing areas in Indianapolis. The measure would establish a redevelopment district with power to levy taxes, but not to issue bonds; create a non-paid redevelopment commission, and grant the commission authority to acquire and redevelop blighted areas either within the city or within 1,000 feet outside in unincorporated territory. After buying up slum areas with the tax funds, the commission would resell them for private development. The proposed legislation would grant no tax exemption, except on such portions of the acquired properties as were held for public use for parks, flood control or other public purposes.

Texas legislation was being sought to enable cities to assemble large blocks of property through condemnation and then permit the leasing or resale to private enterprise for redevelopment.

Indications were that Pennsylvania's Legislature would amend its laws to permit insurance companies to invest their funds in long-range housing projects. Existing Pennsylvania laws do not permit insurance companies to invest their funds in real estate for a period of more than five years unless an extension is granted by the state insurance commissioner.

New York's Governor Thomas E. Dewey recommended that efforts to aid private enterprise to provide adequate low-rental housing be broadened in that state, which has pioneered in legislative action in this direction.

Under consideration in Milwaukee at this writing were a redrafted local urban redevelopment bill and amendments to the local housing authority law there to facilitate the elimination of blighted housing areas by private capital. One of the proposes changes would place the housing authority and private redevelopment corporations on a par in receiving assistance from the city in that the city could condemn or buy land for sale to either at a price above or below the purchase price, or sell city-owned land for redevelopment of blighted sections above or below cost or market price.

These developments all contribute to a steadily emerging trend, which also made progress last year. At the November elections Maryland voters approved the creation of a Baltimore redevelopment commission, and Kansas City, Missouri, voters gave the city council there wide powers for blighted-area clearance. Designed to encourage slum clearance and redevelopment by private capital, the Kansas City character amendment gave the city council authority to condemn property and sell it for such purposes. The Maryland amendment is designed to permit redevelopment along lines being taken in New York.

A law empowering municipalities to contract with development companies to reclaim blighted areas was enacted last year in New Jersey. Under this statute municipalities can condemn land, sell it at cost to development companies, and freeze tax assessments up to 25 years.

PERSONAL MENTION

W. E. Clark

WILLIAM E. CLARK has been appointed general manager of the Keystone Sand Division of Dravo Corporation, Wilmington, Delaware. The activities of the W. E. Clark Company, wholesale construction material, will be merged with those of Keystone Sand and will operate under the latter title.

Mr. Clark is a graduate of Ohio State University, where he received his degree as mining engineer in 1921. He went to Mexico with the American Smelting and Refining Company's Mexican division. Before becoming affiliated with Keystone in 1930, Mr. Clark had been employed by the Lehigh 108 Portland Cement Company as manager of the Pittsburgh office. In 1937, he was named president of the Miller & Coulson Company, which later became known as the W. E. Clark Company.

Recalled to Dravo during the war emergency, Mr. Clark was sent to Wilmington as assistant to the vice-president. Subsequently he became administrative manager of the Wilmington yard, his position until the recent promotion.

ROBERT G. RAUSCHER, comptroller and assistant treasurer of the Warner Company, Philadelphia, has been re-elected a director of the Philadelphia Control of the Controllers Institute of America for the 1945-1946 fiscal year.

DAVID P. KEISTER, district sales manager for the Huron Portland Cement Company at Grand Rapids, Michigan, recently retired after 34 years of service. Charles De Hoog succeeds Mr. Keister.

ROY E. MAYES, president of the Carthage Marble Corporation, Carthage, Missouri, recently was elected president of the Carthage Chamber of Commerce.

JAMES G. LACY has been appointed district sales manager of the Missouri Portland Cement Company at St. Louis, to succeed Ray H. Masters.

MRS. LILLIAN E. SNOUFFER, widow of the late Lawrence L. Snouffer, has been elected to succeed him as president of J. & L. Snouffer, Inc., Dublin, Ohio, producers of agricultural limestone. Other appointments were: Irven J. Horch, vice-president and general manager; Robert L. Snouffer, secretary and assistant manager.

JOHN P. BURROWS of the International Minerals & Chemical Corporation, has been transferred from Carlsbad, New Mexico, to the company's home office at Chicago, where he will be assistant general purchasing agent.

This Ad Written by Users of the EAGLE "SWINTEK" LADDER

"We had found our gravel bed too hard to pump after getting into it—12′ to 14′ depth. With an Eagle 'Swintek' Ladder, we have had no difficulty pumping the same deposit to 40′—almost three times the former depth." ***An Indiana operator.***

"Due to oversize rock, we could not have pumped the deposit without our 8″ pipe size 'Swintek' with a 25′ ladder." ***A Texas operator.***

"The 15″ pipe Eagle 'Swintek' Ladder, which we installed six years ago, increased our production 30%, and it has also been a big factor in conserving our aggregates. Repairs have been practically nil." ***A Kentucky operator.***

"The cost of production on our dredging operation was reduced 50% by our Eagle 'Swintek' Ladder." ***An Ohio operator.***

"Our Eagle 'Swintek' Ladder made it possible to remove a glacial drift of sand and gravel, running heavy in boulders, from a rough, undulating solid rock bottom. It took the abuse involved." ***A Massachusetts operator.***

"Our Eagle unit increased production 50% in ordinary gravel and 60% in hard pumping. Where gravel with oversize boulders up to 2″ was worked, production was increased 350%. Power cost was reduced 37%." ***An Iowa operator.***

(The names of these operators will be furnished on request.)

Nothing need be added to the above, except that you, too, can increase your profits with the Eagle "Swintek" Ladder, through lowered cost of the material actually pumped. Write for bulletin.

The cutters loosen deposit and insure uniform feed of solids; at the same time carrying oversize up the ladder as the endless chain passes over the nozzle, where it acts as a screen.

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133 Holcomb Ave.
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EAGLE ***Specialized Sand and Gravel Equipment***
"SWINTEK" DREDGE LADDERS — SCREW WASHERS
LOG WASHERS — DEHYDRATORS — SAND TANKS
CLASSIFIERS — REVOLVING SCREENS

EAGLE IRON WORKS
DES MOINES, IOWA
"SERVING INDUSTRY FOR OVER SEVENTY YEARS"

QUENTIN W. BEST, general sales manager with Consolidated Rock Products Company, has been doubly honored by his associates, who recently elected him a member of the board of directors and subsequently vice-president of the company. Before his affiliation with Consolidated Rock Products Company in 1927, Mr. Best had been on the staff of the Blue Diamond Corporation.

A. H. GRAHAM, former lieutenant governor of North Carolina, was appointed chairman of the North Carolina State Highway Commission by Governor Robert G. Cherry, to serve a four-year term ending May 1, 1949. Mr. Graham succeeds Ben Prince, who is now on leave of absence in the army.

LT. H. P. HUDSON, a former employee of the Fischer Lime & Cement Company of Memphis, Tennessee, recently was awarded the Silver Star for gallantry in action with the 1st Army in France during June, 1944.

C. F. RITCHIE recently terminated his affiliation as assistant research director with the American Potash & Chemical Company at Trona, California, to join the staff of the Mallinckrodt Chemical Works at St. Louis.

W. A. BLISS has been elected vice-president of the Keystone Sand Division of the Dravo Corporation, Pittsburgh, Pennsylvania.

HAROLD F. SHELLENBERGER and H. A. ZELIFF have been appointed to new positions on the staff of the Lehigh Portland Cement Company. Mr. Shellenberger, formerly acting superintendent

H. A. Zeliff

H. F. Shellenberger

of the company's plant at Mitchell, Indiana, became plant superintendent. He succeeds H. H. Purkhiser, who died last December.

Mr. Zeliff, who has been chemist at the Birmingham, Alabama, plant, has been named assistant superintendent and supervising chemist.

SQUAD LEADER G. F. JENKINS has returned from overseas to Asbestos Corporation, Ltd., Thetford Mines, Quebec, Canada, to become general superintendent in charge of mills. Mr. Jenkins had been associated with the firm before joining the R.C.A.F. four and a half years ago. More recently he had served overseas in the R.A.F.

OBITUARY

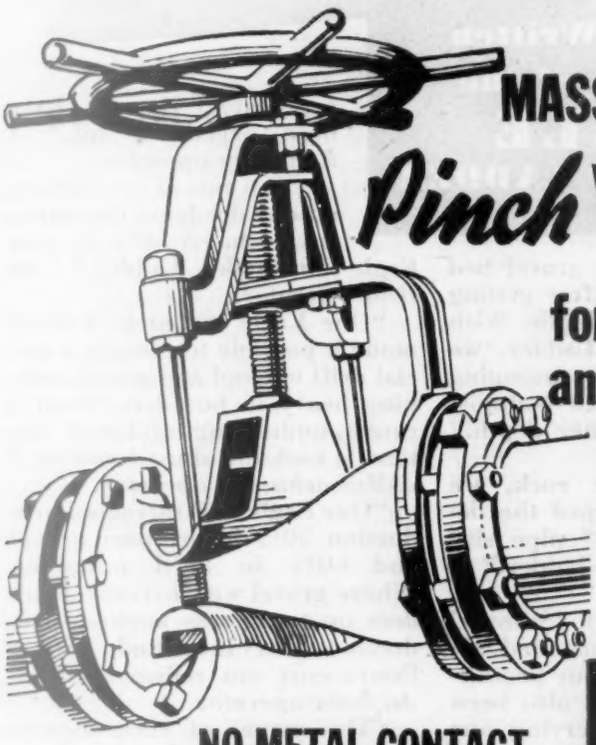
JOHN L. WEBBER, 57, comptroller of the New England Lime Company and assistant to that firm's president, C. C. Loomis, died recently at Canaan, Connecticut. Before joining the staff of the company in 1944 Mr. Webber had served as chief engineer in charge of magnesium for the Defense Plant Corporation.

GEORGE TILLEY SEABURY, 65, secretary of the American Society of Civil Engineers and its executive director for the last 20 years, died May 25 in New York. Mr. Seabury also was president of the Engineering Societies Personnel Service, Inc., and vice-president of the American Engineering Council.

GUILFORD DUNCAN, 67, president of the Ludlow-Saylor Wire Company, St. Louis, Missouri, died on May 9 after an operation. Mr. Duncan, who joined the staff of the firm in 1900, succeeded his father, the late William Duncan, in 1911 as president.

WILLIAM E. LIVINGOOD, 84, who formerly had been associated with the Harry M. Stevens Sand & Gravel Company, died at Shreveport, Louisiana. Mr. Livingood had recently been employed in the tax collection department of Caddo parish.

MORRIS E. PUMPHREY, 60, New York district sales manager for General Refractories Company, died May 31 at his home in Montclair, New Jersey.



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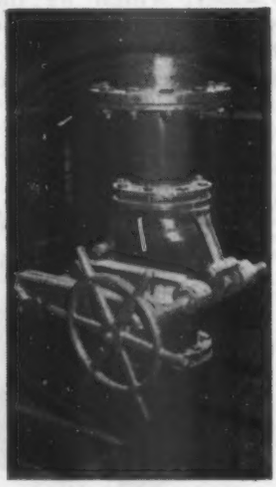

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AUGUSTUS E. DICKINSON, for many years associated with the limestone industry and until 1935 president of the Indiana Limestone Company, died recently in Chicago. In his earlier years, Mr. Dickinson had been affiliated with the Bedford Quarries (later the Perry Matthews & Buskirk Stone Company). Subsequently he purchased the Consolidated Stone Company, which later was merged with other companies to form the Indiana Limestone Company.

HAZEN S. CAPRON, 76, chairman of the board of directors of the Barber-Greene Company, Aurora, Illinois, died in a hospital at Champaign, Illinois, on May 4.

CHARLES D. KESLER, 44, who had been directing the planning of Oklahoma's post-war highway construction program, died May 11 in an Oklahoma City hospital. Mr. Kesler had been with the plans and surveys section of the Oklahoma State Highway Department for 21 years. He became chief engineer of the section in 1939.

CORPORAL HUGH B. ABBEY, 21, U.S.M.C., died May 19 in Mexico City from injuries sustained in an automobile accident. He was the son of Archibald Abbey, Mexican representative of the Mine Safety Appliances Company, Pittsburgh, who was injured in the same accident. Corporal Abbey had served more than two years in the South Pacific, participating in almost every major engagement. He was wounded at Iwo Jima and had just been released from a hospital in New Orleans.

E. C. DRESSER, 71, owner of the Dresser Sand Company, Leavenworth, Kansas, died on April 22 in Leavenworth. Mr. Dresser took over the company from his father, Virgil Dresser, in 1900. The firm was organized in the late 1860's.

FRANK G. HINMAN, 71, president of the Hinman Asbestos Corporation of Cambridge, Massachusetts, died on April 21 after a brief illness. Since 1927 Mr. Hinman had operated his asbestos business with his son, George W. Hinman. Previously he had been a district manager of the Johns-Manville Corporation.

J. EVERETT GADDIS, 53, owner of the Gaddis Stone Quarry, died April 5 at Van Wert, Ohio.

WALTER S. WARE, 71, who formerly had been associated with the J. R. Ware Sand & Gravel Company of Cincinnati, died recently at Fort Thomas, Kentucky. After the dissolution of the firm Mr. Ware served as a consulting engineer for the government and for private interests.

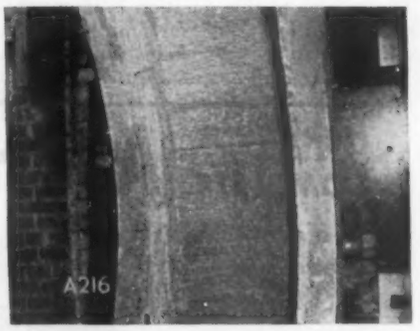
GENE RICHARDSON, 29, of Frankton, Indiana, was killed March 12 when he was crushed beneath a gravel loader at the Richardson gravel pit near Frankton. Ralph C. Richardson & Sons operate the pit.

CHARLES H. LUKENS, owner of the ballast pits at Kern, Missouri, died in St. Louis, March 20.

Dredge Pump Shells *Kept Going* by Build-Up Arc-Welding

The dredge pumps subjected to heaviest duty are usually fitted with austenitic manganese steel shells, for greatest resistance to shock-stresses from boulders, combined with a first class resistance to abrasive wear. Even manganese steel wears out, of course, and it is wise to rebuild eroded areas in a shell before a hole develops or pump efficiency is greatly reduced.

Pictures A-473 and A-474 show the rebuilding of the abraded interior of a manganese steel dredge pump shell by arc welding with Amsco Nickel-Manganese Steel Welding Rod. This material, as weld-metal applied to manganese steel castings, has properties comparable to the parent metal. It deposits in a uniform flat bead without porosity and with very little spatter or crater checks. When used to restore ordinary ferrous parts, the built-up portion offers greater resistance to impact and abrasion than the parent metal. The nickel content of the rod prevents embrittlement of the weld under air cooling and eliminates the necessity for quenching.



Picture A-216 shows the appearance of a pump shell interior rebuilt with Amsco electrodes.

Ask for Bulletin 941-W, which pictures and describes many profitable applications of Amsco welding products.

(Amsco Welding Products are produced and sold in Canada by Canadian Ramapo Iron Works, Inc., Niagara Falls, Ontario)

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OFFICES IN PRINCIPAL CITIES

Legal Decisions

By LEO T. PARKER

●

When to File Silicosis Claim

Considerable discussion has arisen from time to time whether the legal date on which an employee contracts silicosis is when he realizes that he has the disease, or whether it is when he actually begins to feel the effects of the disease without knowing that he has silicosis. The answer to this question is important because various state laws provide that suits for damages, or claims for compensation under the state workmen's compensation laws, must be filed within a specified period of time after the occupational disease was contracted.

Modern higher courts recognize that an occupational disease such as silicosis is, in its ordinary and accustomed sense, a disease which is the natural incident or result of a particular employment, usually developing gradually from the effects of long-continued work at the employment. Therefore, they have adopted a rule that a suit for damages, or claim for compensation, need not be filed within the statute period before the employee knew that he had contracted it.

For instance, in *Urie v. Thompson*, 176 S. W. (2d) 471, it was shown that a state law provides that an employee who sues for compensation for an occupational disease must file the suit or claim within three years from the date on which the disease was contracted. The employee filed suit within three years from the date on which he first discovered that he had contracted silicosis. However, it was contended by the employer that the employee's claim was barred because he had failed to file the claim within three years from the date on which the disease actually was contracted. The higher court refused to agree with this contention, saying:

"Silicosis is an occupational disease, . . . It follows that no specific date of contact with the substance can be charged with being the date of injury, inasmuch as the injurious consequences of the exposure are the product of a period of time rather than a point of time; consequently the afflicted employee can be held to be 'injured' only when the accumulated effects of the deleterious substance manifest themselves, and this would be when the employee becomes disabled."

Also, see *Madison v. Wedron Silica Company*, 352 Ill. 60, in which an employee sued for damages due to injury from the disease of silicosis. The employee started working for the employer in 1924 and continued until 1930, when he "was forced to quit work because of his condition" caused by silicosis.

The employer contended that a two-year state statute of limitations barred recovery by the employee because the first inhalation or breach of duty was the commencement of the injury and that the suit should have been filed within two years after this time. The court said:

"This court has recognized that an occupational disease is of slow development; an insidious illness that creeps unnoticed upon its victim. . . . To say that the plaintiff (employee) must have filed suit at the time of the *first* inhalation of the silica dust means that an injury could not, as a matter of fact, be proved. . . . The logical view is to consider the time when the employee is forced to quit work because of the cumulative effect of successive injuries resulting in final disablement rather than the first inhalation or injury. . . . The statute of limitations does not commence to run until the right of action arises. That arises upon disablement, *i. e.*, when the occupational disease puts him in such a condition that he must quit work."

Also, in *Plazak v. Allegheny Company*, 324 Pa. 422, 188 A. 130, the suit was to recover damages for injury resulting from the disease of silicosis. The statute of limitation was interposed by the employer. The court said:

"The time when the injury has been wrongfully inflicted, when the cause of action accrues, and from which the limitation period begins, in actions of the class to which this belongs, is when the breach of duty to provide a reasonably safe working place occurred."

Another leading higher court case is *State Industrial Accident Commission*, 124 Cal. App. 378. The injury was due to silicosis. This court said:

"An occupational disease, such as that which is before us in the present proceeding, is one in which the cumulative effect of the continual absorption of small quantities of deleterious substance from the environment of the employment ultimately results in manifest pathology; any one exposure to the deleterious substance is inconsequential in itself, but the accumulation of repeated absorptions

(*Continued on page* 161)

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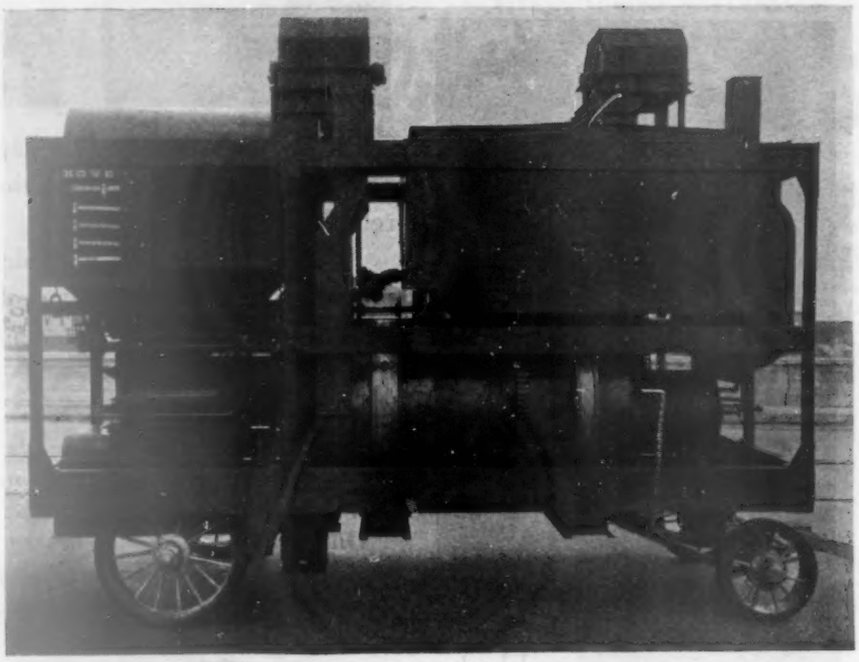

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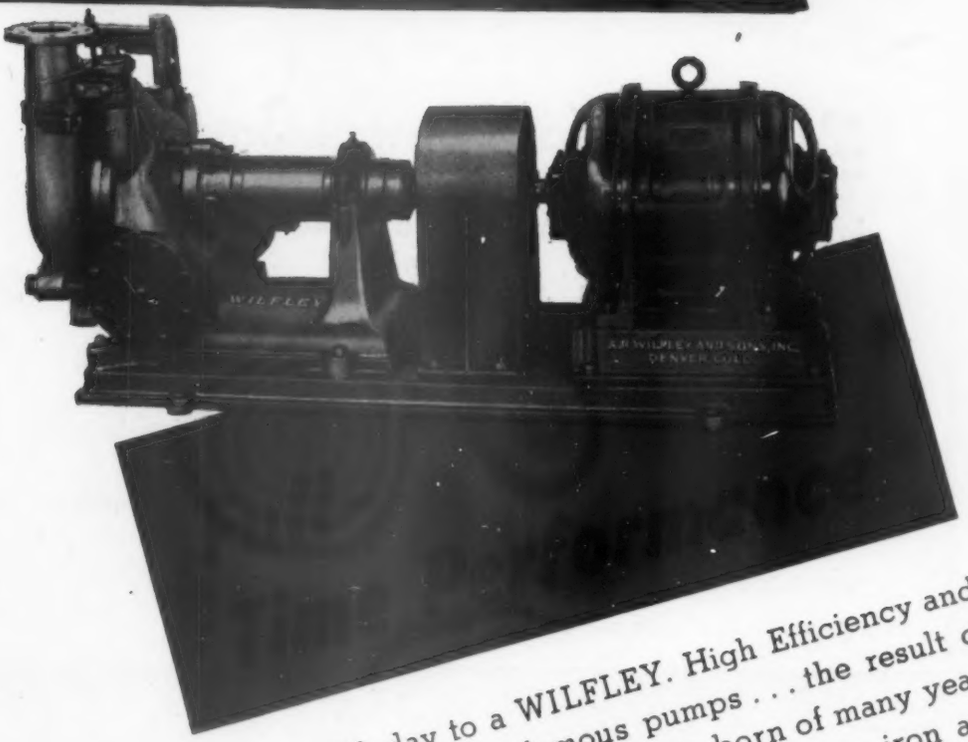

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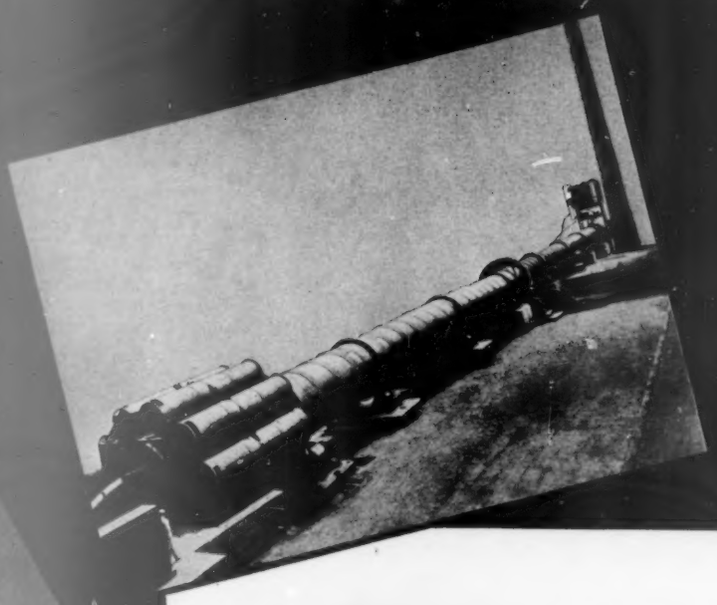

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NEW YORK, N. Y.

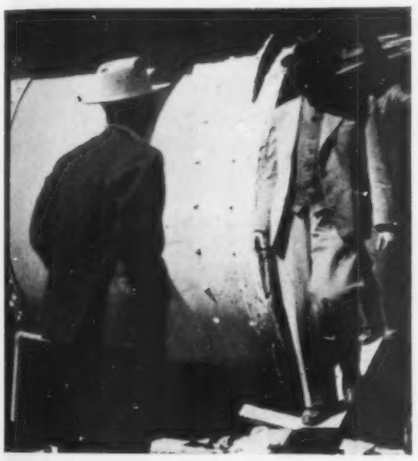
Mexican Cement Industry Has Doubled Its Producing Capacity Since 1942

New Plants Now Being Built Under Severe Handicaps Will Triple Capacity

By W. E. TRAUFFER

another ON THE SPOT report

THE rapid development and expansion of the cement industry in Mexico in recent years portrays, with perhaps some exaggeration, the economic development of that country. Formerly largely an agricultural country dependent on others for most of its needs, Mexico has in recent years been rapidly industrialized with much of its urban population moving to the larger cities. The Government has fostered this development by building better roads and hydro-electric projects, installing water and sewage facilities, etc., and has furthered the agricultural development by means of irrigation projects. Foreign capital has also been permitted to participate to a limited extent in the building of new industries.



Gustavo P. Serrano, Minister of Economy, on an inspection trip through the "Cruz Azul" plant at Jasso.

The result, coupled with the war demands, has been an unprecedented building boom with a huge demand for cement which has far exceeded the output of the industry. To meet these demands the existing cement plants have been enlarged and many new ones have been built or are under construction. The capacity of the industry is now about double what it was in 1942 and when all the plants now under construction are completed, probably in 1946, it will have been tripled.

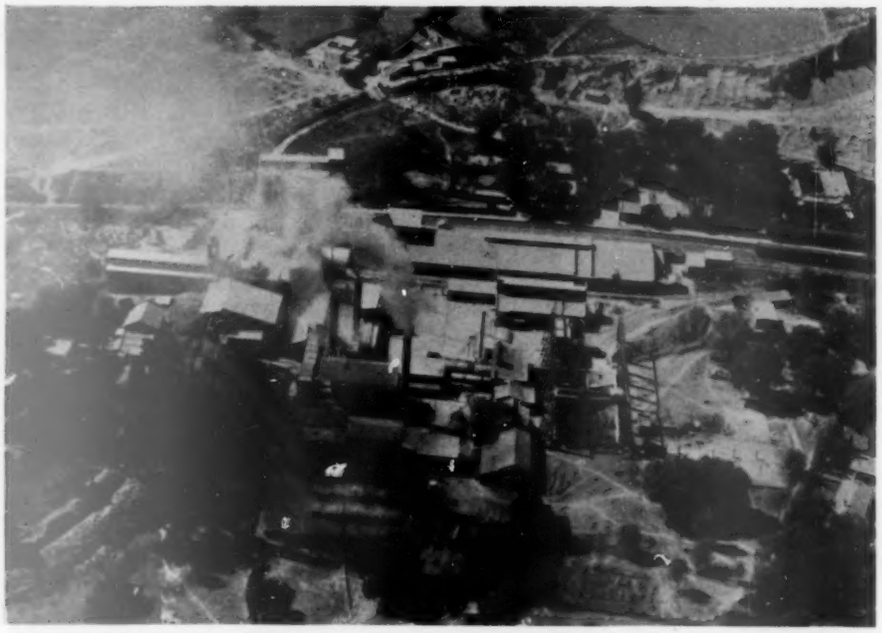
Industry's Outlook Whether this capacity will then exceed the demand for cement is anybody's guess. Some optimists believe that the present building boom and industrial expansion will continue for 8 to 10 more years. Others believe it will not outlast the end of the war, another year or two at most. That the country will, for the first time in its history, be free of the need for cement imports, however, seems quite probable, if the present supply and operating problems of the industry are overcome.

In spite of the rapid expansion of

In this picture, taken at the nearly completed Veracruz plant near Orizaba are Mr. and Mrs. Cole K. Brunner and Mrs. Rudolph (La Consolidada, S. A.), and Mr. and Mrs. W. E. Trauffer (Pit and Quarry).

● The writer has just returned from a 5-week trip through Mexico on which he visited most of the 16 cement plants either in operation or under construction and on which he talked to most of the important men connected either directly or indirectly with the cement industry. This trip had long been contemplated because of the rapid growth of the industry in recent years and because of the fact that cement producers in the United States have been given little information on the status of the industry in that country except what they could gather from the few brief articles on specific operations which have been published in Pit and Quarry and other publications. The writer also wanted to learn first-hand the problems of the industry in Mexico and to expand his knowledge of the industry there to a comparable point with his knowledge of the industry here and in Canada where, in 17 years of traveling, he has visited most of the plants, including all the newer and more important ones.

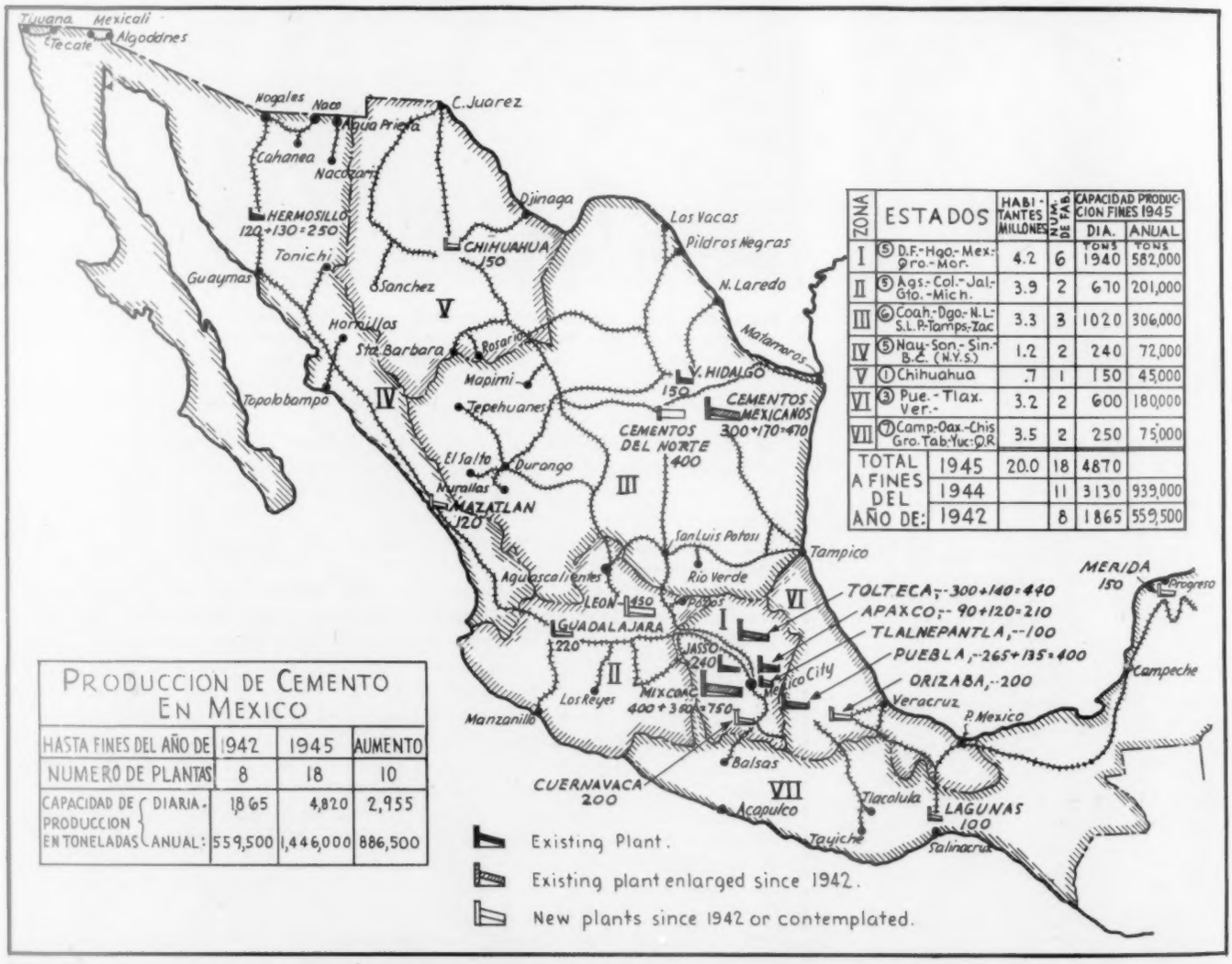
In obtaining the information and photographs for this article the writer is indebted to all the many cement men whom he contacted and in particular to Ing. Federico Barona, Professor of Materials and Construction, Polytechnic of Mexico, who is also connected with the Commissione Nacional de Irrigacione. He is also greatly indebted to Cole K. Brunner and Guillermo M. Velez of La Consolidada, S. A., Mexican representatives of the Nordberg Manufacturing Company, and to R. B. Rodriguez and S. Larios of Allis-Chalmers de Mexico, S.A.—The Directing Editor.



Aerial view of the La Tolteca plant at Tolteca, Hidalgo. The quarries are visible in the right background.

the industry the demand has grown even more rapidly with the result that imports in the last two years have skyrocketed. This upsurge in imports has, however, been largely due to the fact that the 20 peso per metric ton (70 cents per bbl.) import duty has been temporarily waived or franked at the request of the industry in order to help defeat the black market which developed in some areas when the shortage became acute. The "Reguladora del Commercio del Cemento" board which formerly sought to regulate the cement market, has been abolished.

Cement Imports and Production Some interesting figures are available on the imports into Mexico from the United States. These show that, of the 69,556 tons (408,000 bbl.) imported in 1944 about 33 per cent. went to the northern border state of Chihuahua from El Paso. About 25 per cent. was shipped from California plants into the northwestern border state of Sonora by rail and water and through other West Coast ports by water. About 20 per cent. was shipped into the northeastern border and Gulf states from Texas plants by rail through Laredo and by water through Tampico. About 22 per cent. came from New Orleans through Gulf ports into the states of Veracruz, Yucatan, etc.



ZONA	ESTADOS	HABITANTES MILLONES	NUM. DE FAB.	CAPACIDAD PRODUCCION FINES 1945 DIA. TONS	ANUAL TONS
I	⑤ D.F.-Hgo.-Mex.-Qro.-Mor.	4.2	6	1940	582,000
II	⑤ Ags.-Col.-Jal.-Gto.-Mich.	3.9	2	670	201,000
III	⑥ Coah.-Dgo.-N.L.-S.L.P.-Tamps.-Zac	3.3	3	1020	306,000
IV	⑤ Nay.-Son.-Sin.-B.C. (N.Y.S.)	1.2	2	240	72,000
V	① Chihuahua	.7	1	150	45,000
VI	③ Pue.-Tlax.-Ver.-	3.2	2	600	180,000
VII	⑦ Camp.-Oax.-Chis.-Gro.-Tab.-Yuc.-Q.R.	3.5	2	250	75,000
TOTAL A FINES DEL AÑO DE:	1945	20.0	18	4870	
	1944		11	3130	939,000
	1942		8	1865	559,500

PRODUCCION DE CEMENTO EN MEXICO			
HASTA FINES DEL AÑO DE	1942	1945	AUMENTO
NUMERO DE PLANTAS	8	18	10
CAPACIDAD DE PRODUCCION EN TONELADAS DIARIA	1865	4,820	2,955
CAPACIDAD DE PRODUCCION EN TONELADAS ANUAL:	559,500	1,446,000	886,500

Map of the National Irrigation Commission with the country divided roughly into seven zones which can be most efficiently and economically served from the plants in them. The tables give the capacity figures for these zones, and other data.

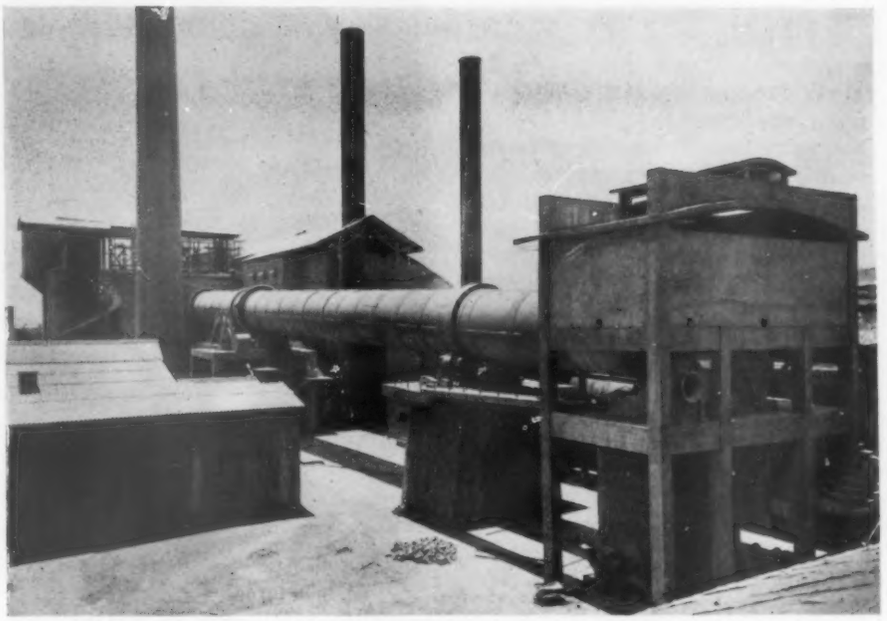
The following tabulation shows the official government figures for the domestic output and the imports of cement in recent years.

	Domestic Output		*Imports*	
Year	*(metric tons)*	*(barrels)*	*(metric tons)*	*(barrels)*
1936	285,978	1,677,000	6,897	40,500
1937	344,693	2,020,000	11,757	68,900
1938	373,712	2,190,000	13,382	78,400
1939	409,784	2,400,000	5,083	29,800
1940	484,992	2,840,000	4,475	26,250
1941	537,464	3,150,000	4,055	23,800
1942	560,405	3,280,000	6,380	37,400
1943	596,690	3,500,000	42,962	250,500
1944	619,096	3,630,000	69,556	408,000
1945*	750,000	4,400,000	100,000	586,000

*(est.)

As shown in tables in the accompanying map the actual production has in recent years lagged far behind the theoretical plant capacity. In 1944 the output was only 619,096 tons (3,630,000 bbl.) or only 66 per cent. of the 939,000-ton (5,500,000 bbl.) plant capacity. This was due to a number of reasons which will be explained. It is estimated that about 750,000 tons (4,400,000 bbl.) will be produced in 1945 with a plant capacity by the end of the year of about 1,446,000 tons (8,480,000 bbl.).

Transportation Difficulties The lag in production has been due almost entirely to factors beyond the control of the cement industry. The main reason probably has been the lack of adequate railroad transportation, not only of the finished cement but also of the fuel oil needed to operate the plants and in some cases also of the raw materials for the plants. In the latter category the plant of Cementos de Mixcoac, for example, which hauls its limestone more than 40 miles, has had to get along on only about 60 per cent. of its annual requirements. The Guadalajara plant, with a 103-mile haul, has had to shut down entirely several times for lack of raw material. Several producers have helped their position somewhat by purchasing railroad cars to alleviate the occasional car shortage. The Minister of Economy, Gustavo P. Serrano, has in this emergency taken drastic steps to provide the necessary materials and supplies for this industry.



The 10- by 175-foot kiln being installed in the plant of Cementos Mexicanos, S. A., at Monterrey, Nuevo Leon.

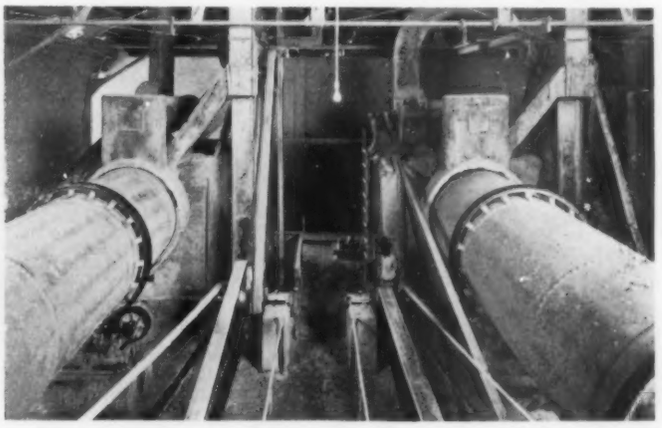
The shortage of fuel oil is also serious and is due not only to inadequate rail transportation but also to insufficient production to meet the growing needs. This shortage is naturally most serious at the points most remote from the major oil fields in the Tampico area. I can personally attest to the similar shortage of gasoline in some areas, having been glad many times that I carried a few additional gallons in cans to use in emergencies only. On other occasions where no gasoline could be purchased locally I was able to get some from the companies called on.

There has been some recent improvement in the rail situation due to the combined efforts of the railroads and Petroleos Mexicanos, the official oil company. The oil company is building pipelines and reconditioning refineries. The government-controlled National Railways have added more rolling stock and taken other measures with the result that the cargo car movement in January, 1945, was the highest for some time. Many of the cement companies have helped their own positions by purchasing fleets of tank cars.

The cement delivery situation is also being improved with additional cars but is still acute. Some plants suitably located are partly solving the problem through increased truck deliveries but this can usually be done only in a limited radius because of the mountainous terrain in most sections and the shortage of trucks, tires, gasoline and repair parts.

The shortage of electricity during the dry seasons has also been a factor in some areas depending on hydro-electric power. In order to improve this situation the Federal Government, state administrations and private interests are building

The ½-cubic-yard shovel in the Cementos Mexicanos quarry.



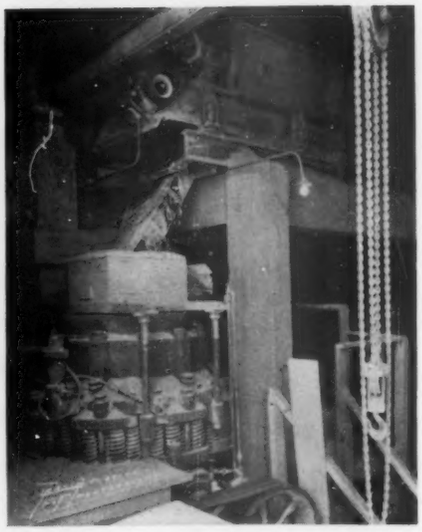
The two 6- by 45-foot double-shell driers in the Mexicanos plant.

more power plants. Some of the cement companies have become partly or entirely self-sufficient by the installation of waste-heat boilers. As purchased power costs are low, in some areas from 0.4 to 0.6 cents per kw. hr., few companies operate separate power plants. At present the 16 plants in operation or under construction are equipped to produce 39 per cent. of the power required.

Cement The Government, aided by most of the privately-owned cement companies both individually and through their association, the Officiña de Industrio de Cemento, has made considerable progress in overcoming the black market which, as in any country, springs up when the demand for anything exceeds the supply. As might be expected the black market has been worst in the Mexico City area where the demand is greatest. With a normal plant price of 60 to 65 pesos per metric ton ($2.11 to $2.28 per American barrel) cement has been sold there for as much as 200 pesos per ton. In other areas the normal plant price is as high as 86 pesos per ton ($3.00 per bbl.).

The duty-franking of imports has helped the situation only in the border areas where the hauls from American plants are comparatively short. Except in these areas the lower plant price of American cement is overcome by the longer hauls, transportation difficulties, fees to middlemen, speculation, etc.

I could describe in detail some of the truly heroic efforts being made by some of the cement companies, both individually and collectively, to keep the flow of cement in legitimate channels. This has included widespread newspaper advertising of legitimate f.o.b. plant prices, the offering of rewards for information on price violators, the sale of cement



The 3-foot short-head cone crusher and vibrating screen following one of the two stone driers in the Mixcoac plant.

only through reputable dealers who are black-listed if found violating established price setups, and many even more drastic measures.

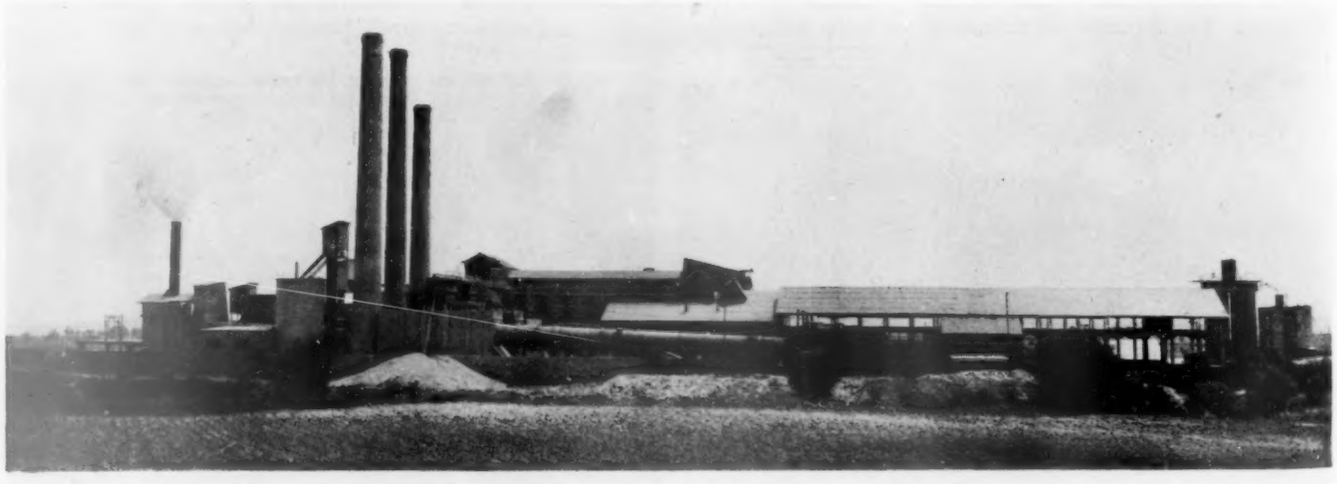
Recently there has also been a paper bag shortage which is more serious than it might appear as practically all the cement in Mexico is sold in Mexican-made paper bags of both the sewn and pasted types. Cloth bags are almost non-existent and few plants or users are set up to handle bulk cement.

Labor The labor situation has also handicapped the industry to some extent but this also is largely an indirect result of the war and should be only temporary. Wages have increased rapidly in recent has been worst in the Mexico City years but they, and the cost of living, are still far under United States levels. As a result the shortage of agricultural workers here has temporarily attracted many thousands of Mexican workers, many of them of the semi-skilled class widely employed in the cement industry.

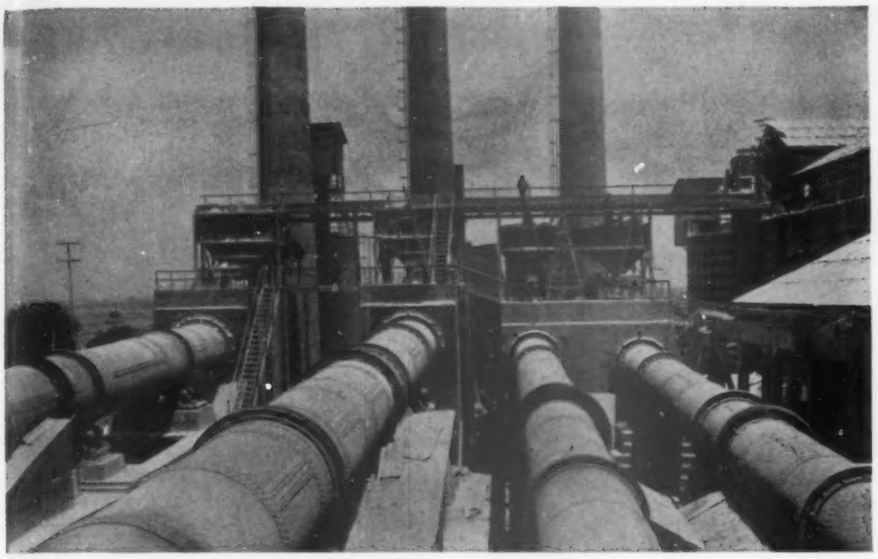
During recent years the Government policy had been aimed almost entirely at the improvement of the economic position of the worker with the result that extremes were reached which hampered the economic and industrial development of the country. As in this country, union leaders and the government are now realizing this and some of their more drastic demands are being moderated.

The ascendancy of labor in Mexico began in 1931 when a labor law was passed which required that each factory make a collective labor contract with its employees. This contract can be revised at 2-year intervals by petition of either party. As a result labor, in the cement industry at least, has asked for and gotten a general increase in pay every two years, as well as other advantages. In many cases workers' wages have doubled or tripled in the past 5 years. This has been particularly true in and near Mexico City and other large industrial centers and has forced manufacturers to raise the prices of their products.

Location of Plants It is difficult for an American not familiar with Mexico to realize some of the physical problems which confront the Mexican cement industry. From a glance at the accompanying map it would appear that the cement plants are so located that there would be much overlapping of sales territories. There are, however, vast areas which are either sparsely inhabited or with a primitive Indian population which consumes little cement; there are widespread mountainous areas, some of which are not crossed by passable roads or by railroads, others only through passes up to 12,000 feet above sea level. These factors, with the limited mileage of good roads



The plant of Cementos Atoyac, S. A., at Puebla with clinker and gypsum storage building at right. In right background is the affiliated Plastocement mortar cement plant.



The two 6- by 135-foot and two 8- by 135-foot kilns in the Atoyac plant. The two small kilns have a common stack.

and railroads, present many difficult distribution problems and have had an important bearing on the selection of plant sites.

This map, devised by the Commissione Nacionale de Irrigacione (National Irrigation Commission) which corresponds to the U. S. Bureau of Reclamation, divides the country into seven zones on the basis of the locations of the plants and the natural market areas into which they can most economically ship. These zones do not, of course, represent a rigid division of markets as there is no restriction of cement shipments but in some cases natural barriers or lack of transportation facilities achieve the same results. For example, part of the state of Oaxaca, its capital of the same name included, is in zone No. III but gets its cement from Puebla in zone No. VI because of the better rail connections.

To anyone familiar with Mexico it is also apparent in this map that these plants are well located to serve the major industrial and agricultural areas of the country. The latter fact fits in well with the long-range plan of the National Irrigation Commission to build irrigation projects in various sections of the country. A number of these projects are already completed or well under way and this work is requiring large quantities of cement.

Foreign Capital The policy of the Mexican Government has for some years been to restrict foreign capital to 49 per cent. of the ownership of any industrial operation. Because of this and the fact that Mexican capital has in recent years developed new confidence in Mexican industry the cement industry is now largely Mexican owned. The few exceptions are said to be companies which were in operation before this policy was adopted and which are being permitted to continue on that basis, but even in these companies a large and growing percentage of the stock is Mexican owned.

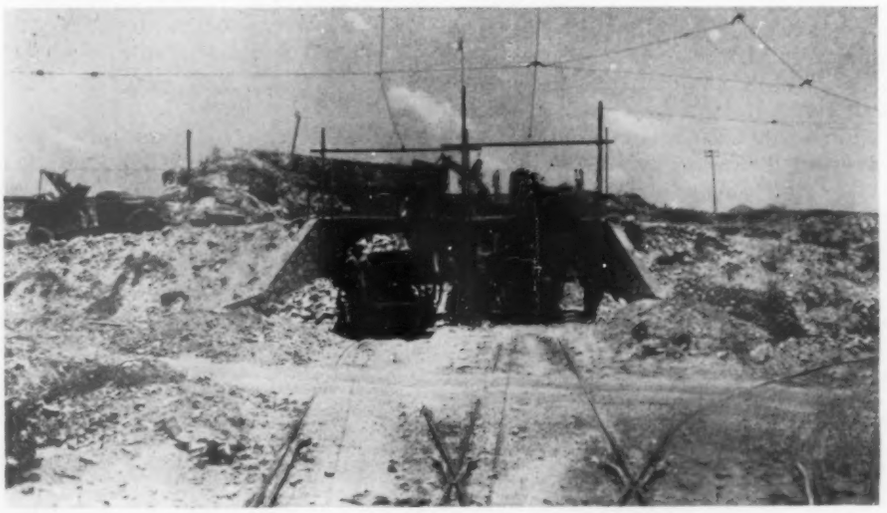
Little information on the ownership of the various plants is available but it is known that most of them are almost 100 per cent. Mexican with individual Americans holding minor interests in a few. The only case where an American cement company is known to own a substantial interest in a Mexican plant is the Marquette interest in the Veracruz plant and in the projected Chihuahua plant. The only known English interest is Associated's share in the Tolteca-Mixcoac combine which is the largest producer in Mexico, providing 41 per cent. of the total output in 1944.

A considerable interest in various Mexican cement plants has been held at one time or another by three of the four major banking groups in Mexico. The Banco Internacional now owns the Guadalajara plant and is financing the construction of the Leon plant. The Banco de Commercia is said to own the Atoyac company and its Plastocement subsidiary and a large share of the Veracruz stock. The Banco Nacional de Mexico at one time held a large part of the Cruz Azul bonds but is not known to have any interest in the industry now.

Two of the companies, "La Cruz Azul" and Hidalgo, are owned and operated by workers' co-operatives. The three plants operated by these companies have about 10 per cent. of the total capacity of the industry.

Production Efficiency None of the plants in Mexico can compare with the best plants in this country either in efficiency or in size but many of them are well designed and operated. In making any such comparison it must be remembered that there is not the premium on mechanical efficiency that exists in this country because of the comparatively low labor cost. Many operations can be done most economically manually in Mexico which must be done mechanically here. One must also bear in mind the fact that nearly half the capacity of the industry has been added since the United States entered the war and that very little new equipment has been obtainable.

While production costs may average a little higher in Mexico, because of the high fuel and maintenance costs and the high power costs in some areas, the average price received for cement in Mexico



Stone being dumped from truck skip-buckets into railroad cars in the Atoyac quarry.

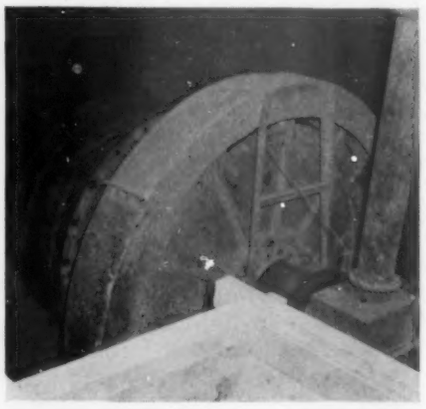
In this photo taken outside the office of Cementos Atoyac are, left to right: Daniel Vega, assistant chief clerk; John A. Blank, consulting engineer; Alton J. Blank, general manager; Luiz Garza, chief clerk; Carlos Maldonado, storeroom; Manuel Maldonado, accountant; Oscar Grados, chemist; Francisco Santillana, superintendent.

is considerably higher than in this country. I was told by several people who are in a position to know that all except a possible few of the plants are showing substantial profits even under present difficult operating conditions. I was told by many operators that they plan to build new plants to replace their present ones or that existing plants will be substantially rebuilt when new equipment again becomes available.

My impression is that the industry in general has done a good job of expanding its capacity under almost the worst conceivable handicaps. The plants are being operated under adverse conditions which the industry in this country has never experienced to my knowledge. It is remarkable that some of the plants have been able to operate at all under these conditions and it is a tribute to the ingenuity and resourcefulness of the men in charge of operations that they have been able to do so.

Most of the equipment in Mexican cement plants was made in this country but there is some of German manufacture. Both the Hidalgo and Jasso plants were partly equipped by Krupp but when the latter was enlarged American equipment was used. All are dry-process plants except those at Lagunas and Hermosillo. All are fired with fuel oil testing about 19,000 B. t. u. per gallon.

Types of Cement For some years the Mexican cement industry has been using, with some minor modifications, the A. S. T. M. specifications for cement. During the present cement shortage, however, the specifications have been relaxed and standard



One of the three 8-foot ball mills used in the Atoyac plant for raw and clinker grinding.

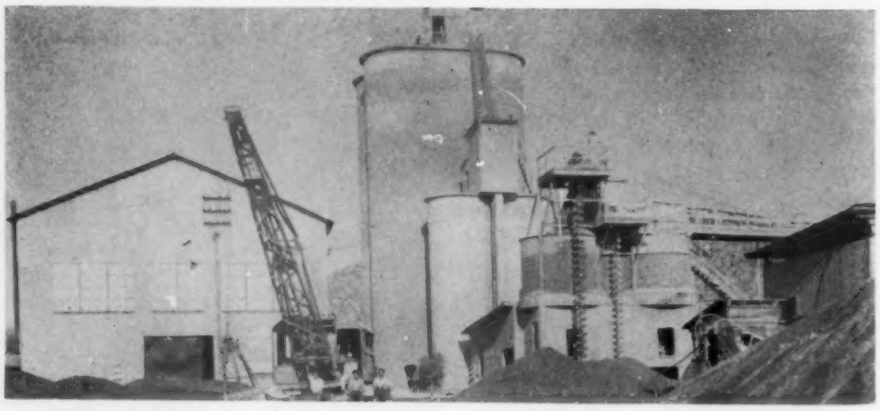
Portland cement ground to 1,300 cm.^{2} per gram instead of 1,500 is acceptable. The Portland pozzuolan cements made by Atoyac, Guadalajara and Nacional, the low-heat cements made by Nacional and Mexicanos, the white cement made by Mexicanos and Blanco, and the del Norte slag-Portland cement must all meet the 28-day tests for standard Portland cement.

Until 1933 all of the major plants in Mexico made only standard, white, high-early strength and masonry cements. In that year the Atoyac plant introduced a Portland pozzuolan cement made by the Blank process. Within six months this cement became the sole product of this plant and has been ever since. This plant is also said to have been the first to produce several other types of special cements. When the Guadalajara plant went into operation in 1943 it also made Blank Portland pozzuolan cement but has since developed a similar cement of its own design. It was at one time thought that the new Veracruz plant would also produce this type of cement but, according to the latest reports, it will start out on standard Portland cement.

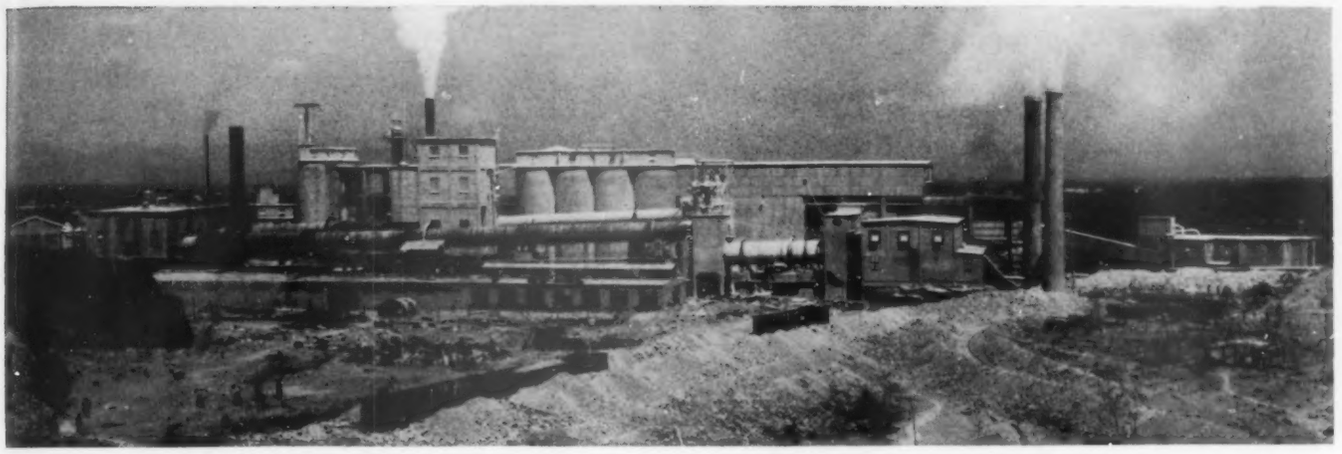
Until sometime in the 30's all the white cement used in Mexico was exported by Medusa and Universal-Atlas. Then Cementos Mexicanos began to make this cement in Monterrey and does so intermittently in its regular plant. When the "Polar" plant at Tlalnepantla went into operation in 1944 it was the first plant to be built solely for the production of white cement.

The del Norte plant at Monterrey, which will probably go in operation early in 1946, will be the first in Mexico to make blast furnace slag-Portland cement. It will be a grinding and packing plant only and will use 25 per cent. Portland cement clinker from Cementos Mexicanos and 75 per cent. blast furnace slag.

Chronological Plant History In chronological order the eleven cement plants now operating in Mexico rank as follows:



Partial view of the wet-process plant of Cementos Portland Nacional, S. A., at Hermosillo, Sonora, which is to be moved and enlarged.



General view of the plant of Cementos de Mixcoac, S. A., in Mexico City, taken from its clay deposit. In the foreground is the new 9½- and 11- by 300-foot kiln.

The plant of Cementos Hidalgo, S.C.L., Hidalgo, Nuevo Leon, was built by private capital and went into operation in 1903. Later it was merged with Cementos Portland Monterrey, S. A., to form Cementos Mexicanos which shut it down in 1930. Under government sponsorship this plant was then taken over by a co-operative of workers which has operated it ever since. This plant has a rated capacity of 150 metric tons (880 bbl.) of standard Portland cement daily, the same as when it was built.

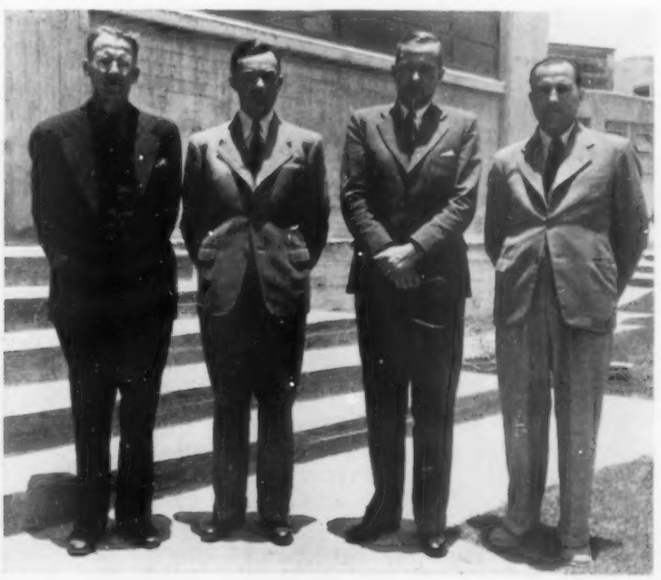
The plant of Cooperativa Manufacturera de Cemento Portland, S.C.L., at Jasso, Hidalgo, was completed in 1910 by private capital. Later it was taken over by La Tolteca but was shut down in 1933 during the depression. This plant was also taken over by a co-operative which still operates it. The capacity of this plant is 240 metric tons (1,400 bbl.) daily, only slightly more than its original capacity. It is planned to build a new and larger plant when equipment is available.

The third plant was that of La Tolteca Cia. de Cemento Portland, S.A., at Tolteca, Hidalgo. This was started in 1916 by the Louisville Cement Company which sold it during the revolutionary period which followed to the Gibbs Portland Cement Company. This English concern had been the chief exporter of cement to Mexico and bought the plant in an effort to retain this market. In 1921 this plant was taken over by its present owners, the Associated Portland Cement Company of Great Britain, which is now said to control about forty cement plants all over the world. Its capacity with four kilns is now 440 tons (2,580 bbl.) of standard Portland cement daily, nearly four times that of the original one-kiln plant. It is planned to rebuild this plant almost completely when equipment is available.

The fourth plant built was that of Cementos Mexicanos, S.A., at Monterrey, Nuevo Leon, which went into operation in 1921 as Cementos Portland Monterrey, S.A. This plant replaced a small pozzuolan cement plant built near the turn of the century. At that time it had a single kiln and a capacity of 175 metric tons (1,025 bbl.) daily. A second kiln, mills, etc., installed in 1931, doubled this capacity and a third now being installed will increase it to 630 tons (3,700 bbl.) daily, making this plant second only to Mixcoac in capacity. Standard, low-heat, modified and white Portland cements are made. When the del Norte slag-Portland cement plant is completed it will take 100 tons daily of the standard Portland cement produced. A separate white cement plant may be built later.

The fifth plant built was that of Cementos Atoyac, S.A., at Puebla, Puebla, which was originally started in 1920 as a three-ton, one-kiln plant by the Landa Portland Cement Company. Later this plant was

This view shows the new kiln at Mixcoac plant. At left is the nodulizer building for the Lepol kiln.



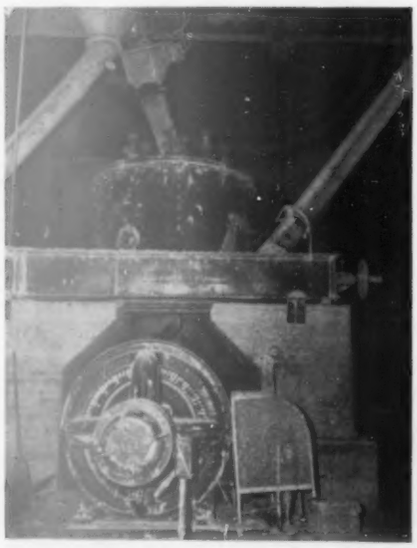
Standing in front of the Mixcoac office are, left to right: Harold Linn, chief chemist; Luis Elek, general superintendent; and Kenneth Bannister, managing director of the Mixcoac and Tolteca plants; and Nicolas B. Borda, superintendent of the Mixcoac plant.

sold to the present owners who added kilns and other equipment in 1928, 1929 and 1943 to make this a four-kiln, 400-ton (2,340 bbl.) plant.

In June 1933 this plant first put on the market the Blank Portland-pozzuolan cement developed by Alton J. Blank and his father, John A. Blank. This cement proved so popular that the entire capacity of this plant has since been devoted to its production.

When the Landa brothers dropped out of this plant one of them started up the Apasco plant and the other started up a masonry cement plant in Puebla near the Atoyac plant. Atoyac now owns this 1,500-ton-(8,800 bbl.) per-month Plastocement plant and another in Mexico City which has a capacity of 5,000 tons (29,300 bbl.) of masonry cement per month.

The sixth plant was that of Cementos Portland Nacional, S.A., at Hermosillo, Sonora, in the far northwestern corner of Mexico, only 107 miles south of the Arizona border. This wet process plant was designed and built by the Macdonald Engineering Company in co-operation with the Traylor Engineering & Manufacturing Company, which



One of the two raw-grinding mills in the Mixcoac plant with air separator above.

supplied most of the cement equipment. It went into operation in 1931 with a capacity of 120 metric tons (700 bbl.) daily. It will soon be moved to a new location to make way for a dam and will be enlarged, with considerable new equipment, to a daily capacity of 250 metric tons (1,460 bbl.) of Portland pozzuolan and low-heat cements.

The seventh producing plant was that of Cemento de Mixcoac, S.A., near Mexico City, a subsidiary of La Tolteca, which started operating in 1931. It was built and

General view of the plant of Cia. Mexicanos de Cemento Portland Apasco, at Apaxco, Hidalgo.

is still controlled by the Associated Portland Cement Company, which also controls the Tolteca plant. Originally a one-kiln plant, it has been steadily enlarged and improved until it now has three kilns and a capacity of 750 tons (4,400 bbl.) daily of standard Portland cement. The third kiln, a cooler and other equipment installed in 1944 made this the largest cement plant in Mexico. Additional cement storage and packing facilities will soon be installed. High-early-strength and masonry cements are also made.

Eighth was the plant of Cia. Mexicana de Cemento Portland Apasco at Apaxco, Hidalgo, which was completed in 1938, six years after construction was begun. This plant was built by Landa after the Puebla plant was sold. It was one of only two plants built in Mexico in which German machinery predominated. The original capacity of 100 tons (590 bbl.) daily was doubled in 1943 by the installation of a second kiln and related equipment. This plant makes only standard Portland cement.

The ninth plant was that of Impulsora de Cementos, S.A., at La Junta, near Guadalajara, Jalisco, which was in full operation late in 1943. This plant was built by the banking firm of J. Lacaud y Cia. as Cementos Guadalajara, S.A., but was sold to the present owners headed by the Banco Internacional, shortly after it was completed. Because of transportation and operating difficulties this plant has never quite reached its designed capacity of 200 metric tons (1,170 bbl.) daily. Additional equipment is now being installed which should make this output possible. Portland pozzuolan and masonry cements are made.

Cementos Portland Moctezuma, S.A., began operations late in 1944 at Cuernavaca, Morelos, with a one-kiln wet-process plant rated at 200 metric tons (1,170 bbl.) daily. Transportation and operating difficulties have held the output down to an average of about eighty tons daily. This plant has an 8- by 260-foot kiln. According to reports, considerable new equipment will be added to this plant when it is available. This plant had generated its own power with three Diesel engines including two Nordberg 550-hp. units and a smaller Worthington unit, but recently went to purchased power. The engines will be held in reserve. The Nordberg engines have quite a history having been sold in 1920 to the Oklahoma Iron Works in Tulsa. In 1941 they were used at a rip-rap quarry on Catalina Island before going to Mexico. The "Moctezuma" brand is used. It is reported that a new group is now in control of this plant.

The eleventh and latest plant to go into operation was that of Cooperativa Manufacturera de Cemento Portland, S.C.L., at Lagunas, Oaxaca, which shipped its first cement late in 1944. This is a one-kiln 80-ton (470 bbl.) capacity plant and is operated by the same co-operative as the Jasso plant.

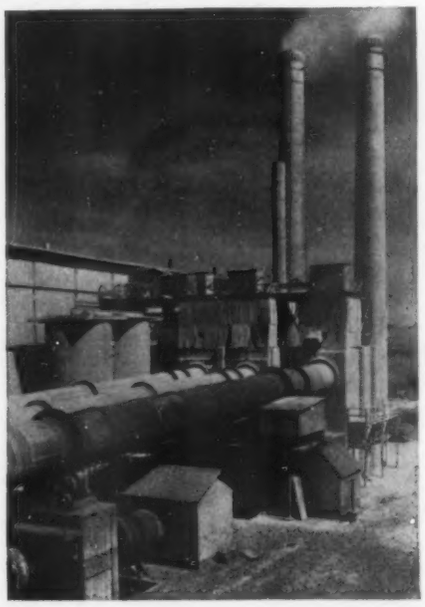
Of the five plants under construction that of Cementos Veracruz, S.A., near Orizaba, Veracruz, will probably be the first in operation. The construction of this plant was begun in September, 1943. One kiln is expected to be in operation by the end of July and the other some time in August. Space has been left for a third kiln to be installed later. This plant will have a capacity of 200 tons (1,170 bbl.) of Portland cement daily but may make Portland pozzuolan cement (Blank type) later. It was designed jointly by Marquette and Atoyac engineers.

Next in operation will probably be either the plant of Cementos Portland del Bajio, S.A., at Leon,

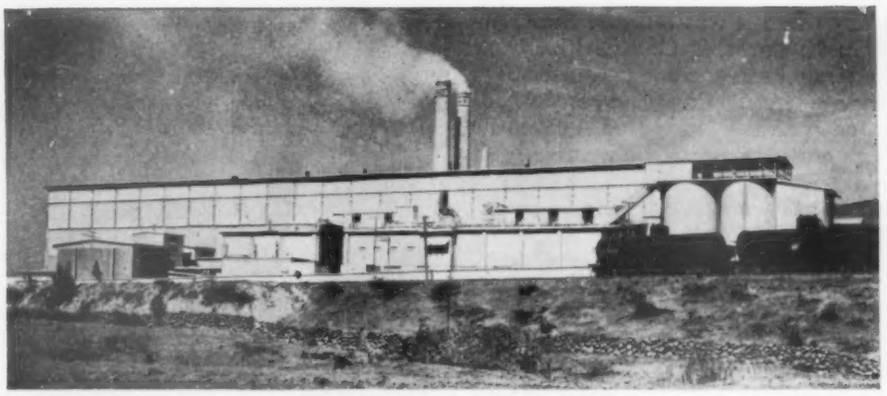
Guanajuato, or that of Cementos del Pacifico, S.A., at Mazatlan, Sinaloa. The foundations for these plants have been poured and some of the equipment has been installed. The uncertainty of delivery of additional equipment makes the date of completion of these plants uncertain. Late 1945 is given by both companies as the tentative date of completion. The Leon plant is controlled by the Banco Internacional interests headed by Luis Montez de Oca which also owns the Guadalajara plant. It will have a capacity of 450 tons (2,640 bbl.) of standard Portland cement daily. The Mazatlan venture is backed jointly by Ramon Salcido, formerly of Apasco, and Ignacio Soto, of Nacional. This plant was designed by the Macdonald Engineering Company and most of the equipment is coming from Universal-Atlas plants. It will have a capacity of about 120 tons (700 bbl.) daily.

The plant of Cementos del Norte, S.A., at Monterrey, Nuevo Leon, is now in the foundation stage and a minor miracle would be necessary to bring it to completion before the end of this year. This company was formed by Cementos Mexicanos and the local steel company, the Compania Fundidora de Fierro y Acero de Monterrey, S.A., to produce a blast-furnace slag-Portland cement. It will be only a grinding and packing plant using 25 per cent. Portland cement from Mexicanos and 75 per cent. slag. Its capacity will be 400 tons (2,340 bbl.) daily.

Little information could be obtained on the 100-ton (586 bbl.), one-kiln plant being built at Barrientos, near Tlalnepantla, Mexico, by Cementos Anahuac, but it is expected to have a daily capacity of 100 tons (590 bbl.) of "Estrella" Portland pozzuolan cement from an 8- by 125-foot kiln. "Anahuac" Portland cement will also be made. Julio Serrano is manager of this project.



The three kilns and their coolers in the Impulsora plant.



General view of the plant of Impulsora de Cementos, S. A., at La Junta, Jalisco. This is the former Guadalajara plant.

Cementos de Chihuahua, of Chihuahua, Chihuahua, has just completed reorganization and with new capital supplied principally by local interests, along with a substantial participation by Marquette Cement Manufacturing Company of Chicago, will shortly begin construction of a new thoroughly modern cement plant in the city of Chihuahua.

The new plant is to be built on the site presently occupied by the old plant which ceased operation in 1943 (see PIT AND QUARRY, September, 1943) and will have a capacity of 150 tons (880 bbl.) per day. Marquette will design the new plant and will participate in its subsequent operation. The design will be such as to achieve the ultimate in operating efficiency and low man-hour utilization despite the extremely small capacity. It is expected that production will be started some time during 1946. Elroy S. Vallina is president of the new company and E. J. Ryan is general manager. Both reside in Chihuahua and have other extensive interests in northern Mexico.

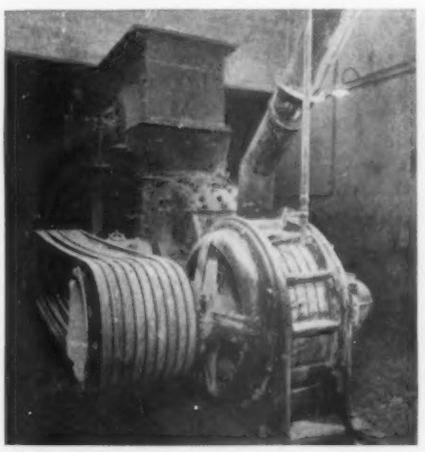
As in this country there have been rumors of other proposed new plants but few of these will probably ever materialize. Probably the most promising of these is projected for Merida, Yucatan, on the Gulf Coast, an area which now gets cement at a high freight cost both from Mexico and the United States. A 40- to 50-ton (230 to 290 bbl.) plant is planned and it is said that about half the necessary capital has already been raised. One drawback to this project is the fact that, while there is plenty of good limestone, there is said to be no suitable clay or shale.

Cemento Portland Blanco de Mexico, S.A., "La Polar," of which Arcadio Hernandez is president, is a privately-owned company having no connection with the co-operative "La Cruz Azul" of which he has been general manager for many years. As its name indicates, this company makes white cement at its plant at Tlalnepantla, Hidalgo, eight miles north of Mexico City, which went into operation in 1944.

It has been rumored that this company is planning to build a second white cement plant in the State of Hidalgo but, according to company officials, the present Tlalnepantla plant will be enlarged. A 7- by 120-foot kiln has already been purchased to supplement the existing 6- by 60-foot kiln. This kiln will also have individual raw and finish-grinding mills and will be followed by a Fuller grate-type cooler.

Cementos Hidalgo, S. C. L., Hidalgo, Nuevo Leon

The plant of Cementos Hidalgo, S. C. L., at Hidalgo, Nuevo Leon, about 30 miles northwest of Monterrey, had a capacity of over 150 metric tons (880 bbl.) of cement



The hammer-mill which is temporarily serving as the primary crusher in the Impulsora plant.

daily when it was built by the Cowham Engineering Co., in 1903, and this has been unchanged. The change from private ownership to a co-operative has been described. The only major change made to this plant was the conversion of its producer-gas power plant to steam. Only the "Cuauhtemoc" brand of standard Portland cement is made in this plant.

The stone is quarried near the plant and goes through a gyratory primary crusher and then to storage ahead of a 7- by 55-foot rotary drier. After further reduction by a Williams hammer-mill, the stone and clay are ground in two stages by two No. 8 Krupp ball mills, followed by three 5- by 22-foot Bonnot tube mills.

There are four 7- by 100-foot Bonnot kilns, followed by rotary coolers of the same make. The clinker grinding is also done in two stages by four Krupp and three Bonnot tube mills. The finished cement is stored in a stockhouse and a Bates 3-tube packer is used.

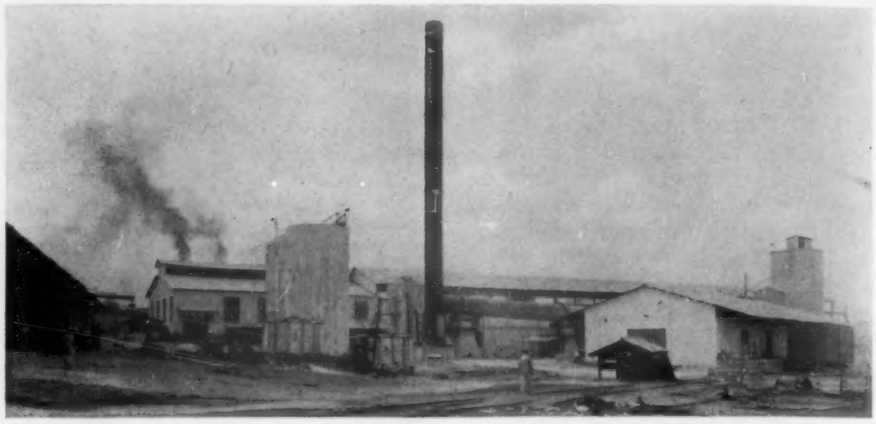
Antonio Lozano is president of this company.

Cooperativa Manufacturera de Cemento Portland, S. C. L., "La Cruz Azul," Jasso, Hidalgo

The plant of Cooperativa Manufacturera de Cemento Portland, S. C. L. "La Cruz Azul" at Mexico City has not been changed since it was built in 1910 except for the additions many years ago of a few grinding mills. Its capacity is now 240 metric tons (1,400 bbl.) daily of "La Cruz Azul" standard Portland cement.

The raw materials—limestone and shale—are air drilled and hand loaded into cars hauled by locomotives. After crushing in two stages the raw material is ground by a Bradley-Hercules mill in one circuit and three tube mills and a compartment mill in another. There are two 8- by 135-foot Allis-Chalmers kilns and an 8- by 150-foot Vulcan kiln followed by two coolers, one serving the two 135-foot kilns. The finish grinding is done in three Allis-Chalmers Compeb mills. An interesting feature of the Cruz Azul operations is the use of short-wave sending and receiving sets at the Jasso and Lagunas plants and the company's main office in Mexico City.

Arcadio Hernandez is general manager of this company and Carlos F. Marroquin is chief engineer.



General view of the plant of Cementos Portland Moctezuma, S. A., at Cuernavaca, Morelos; taken just before the plant went in operation.

La Tolteca Cia. de Cemento Portland, S. A., Tolteca, Hidalgo

The original 1-kiln plant of La Tolteca Cia. de Cemento Portland, S. A., at Tolteca, Hildago, 76 kilometers (47 miles) northwest of Mexico City, has been expanded to four, which give it a capacity of 440 metric tons (2,580 bbl.) of standard Portland cement daily, making it the second largest producer in Mexico, temporarily at least. The third kiln was added in 1927. The fourth kiln, which was installed in 1942, came from the Tod Inlet plant of the British Columbia Cement Company, another Associated plant. The Tolteca brands of cement are used in this plant.

The limestone is air drilled and hand loaded in a quarry 5 km. (3 miles) from the plant and the clay deposit is nearby. Electric trolley locomotives haul the stone cars to the Allis-Chalmers 6K Gates gyratory primary crusher. A set of Sturtevant rolls further reduce the stone.

The clay goes direct into six 70-inch by 30-foot Harding-Ruggles-Coles driers.

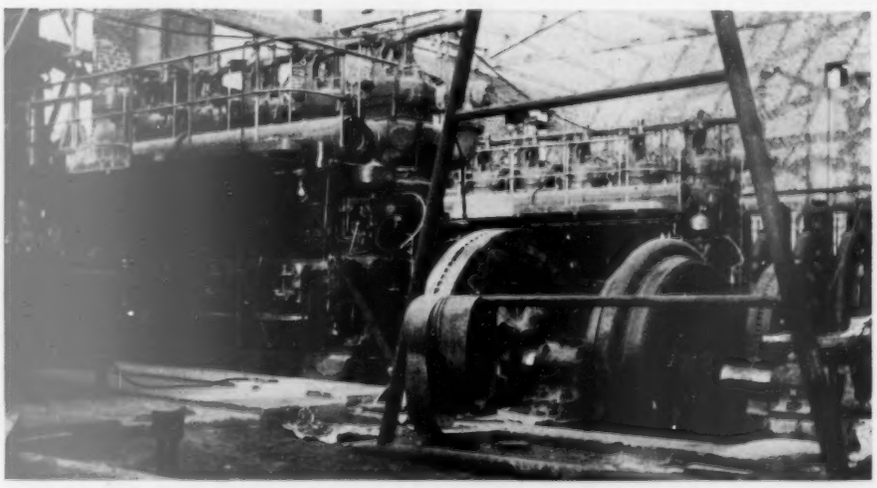
The dried clay and the stone go to Richardson scales and then to the Bradley Hercules preliminary raw mill. From the four Allis-Chalmers 6- by 22-foot final tube mills the raw material goes to blending bins.

The four kilns are of different sizes. In the order of their installation they are 8- by 135-feet, 10- by 150-feet, 8- by 125-feet, and 9- and 10- by 170-feet. All have rotary coolers and the clinker goes to a crane storage.

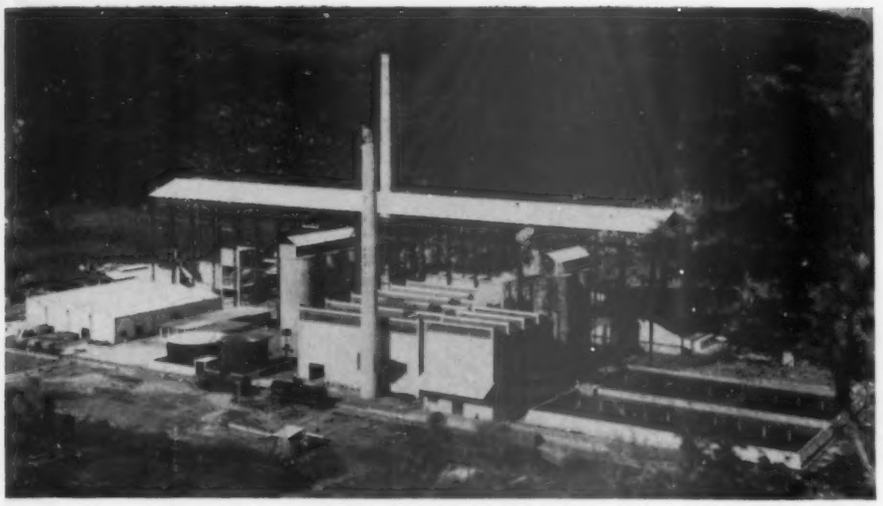
The preliminary clinker mill is also a Bradley Hercules and it is followed by four tube mills—a 5½- by 22-foot Bonnot and three 6- by 22-foot Allis-Chalmers. Fuller-Kinyon pumps convey the cement to the 8,000-ton capacity silo storage and the bags are filled by a 3-tube Bates packer.

The kilns are all connected to an 800-hp. Babcock & Wilcox waste-heat boiler which supplies steam for a 1,100-kw. G. E. turbo-generator. This supplies about half the power needed and the other half is purchased from the Mexican Light and Power Co.

Kenneth Bannister is managing director of both the Tolteca and Mixcoac plants and Luis Elek is general superintendent. Harold Linn is chief chemist of both plants.



The three Diesel engines which supply power for the Moctezuma plant.



General view of the plant of Cooperativa Manufacturera de Cemento Portland "La Cruz Azul" at Lagunas, Oaxaca. Spray cooling ponds are at right.

Cementos Mexicanos, S. A., Monterrey, Nuevo Leon

The plant of Cementos Mexicanos, S. A., at Monterrey, Nuevo Leon, when built in 1921 was a single unit dry-process plant. In 1930 its 175-ton (1,025 bbl.) daily capacity was doubled by the installation of a second kiln, mills, etc., of Traylor manufacture. A third kiln now nearly ready to operate will add about 280 tons for a total capacity of 630 tons (3,700 bbl.) of standard Portland cement daily. This kiln came from the old Aetna plant at Fenton, Michigan. With this kiln a Fuller cooler is being installed, the original crushing department is being rebuilt and a preliminary clinker grinding mill is being installed. Still other improvements are planned.

This plant also makes white, low-heat, and modified Portland cements, using the "Monterrey" and "Hidalgo" brands. For the white cement a pure limestone and white clay are used. The grinding of this cement is done in only one of the two clinker-grinding circuits.

For the other cements the main raw material is a conglomerate limestone from a quarry one kilometer from the plant. The drilling is done with air drills and the stone is loaded by a ½-cu. yd. Link-Belt Speeder shovel into cars hauled by an 8-ton Whitcomb gasoline locomotive.

The pure limestone is purchased from a quarry 6 miles from the plant and is delivered in railroad cars. From 20 to 30 per cent. of this stone is necessary to bring the calcium content to the desired level.

These two materials are crushed separately in the new department. From the cars the stone is discharged on a 4-inch grizzly and the coarse drops into the 24- by 30-inch Allis-Chalmers Superior jaw primary crusher. Iron ore is added to the conglomerate before it goes to the crusher. A pan conveyor and a Chain-Belt bucket elevator feed the minus-5-inch stone to the original revolving screen. The coarse from this screen goes to a new 4-foot Symons standard cone crusher. The screen and crusher fines are carried on a belt-conveyor to the new 8,000-ton capacity concrete stone-storage building. Here the two types of stone are stored separately.

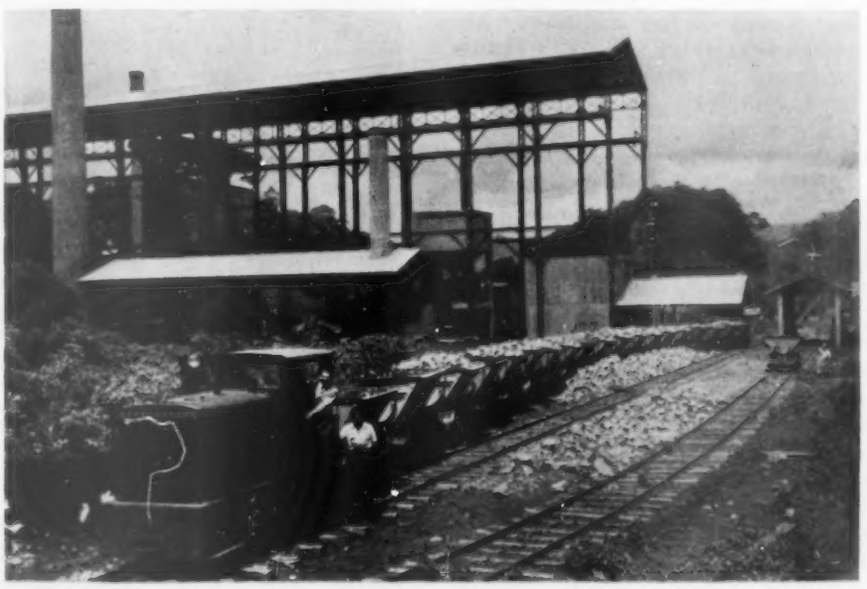
Table feeders under this storage feed the stone on separate series of belt-conveyors and elevators to the two 6- by 45- foot Hardinge Ruggles-Coles double-shell driers. One drier gets conglomerate only and the other a mixture of conglomerate and pure limestone. In this way one circuit processes a stone too low and the other a stone too high in lime. Each drier has following it a 3½- by 12-foot Nordberg Symons screen from which the oversize goes to a 3-foot Symons short-head cone crusher. One of these circuits was installed in 1941 and the other in 1943. The fines from each circuit go into one of two bins over each of the two raw grinding mills. There the final blends are made. The table feeders now in use are being replaced by Hardinge Feedometers.

The 6- by 24-foot Allis-Chalmers and the 7- by 6- by 26-foot Traylor 2-compartment mills each have their second compartments in closed circuit with 14-foot Sturtevant separators. The first compartment of the Traylor mill is in closed circuit with a Tyler Hum-mer screen. The finished raw material goes to four raw-material storage and blending silos.

The two 9- by 120-foot kilns—one a Vulcan and the other a Traylor—each have 6- by 50-foot rotary coolers of the same make. The recently installed 10- by 175-foot Allis-Chalmers kiln is followed by a new 5- by 20-foot Fuller inclined-grate cooler.

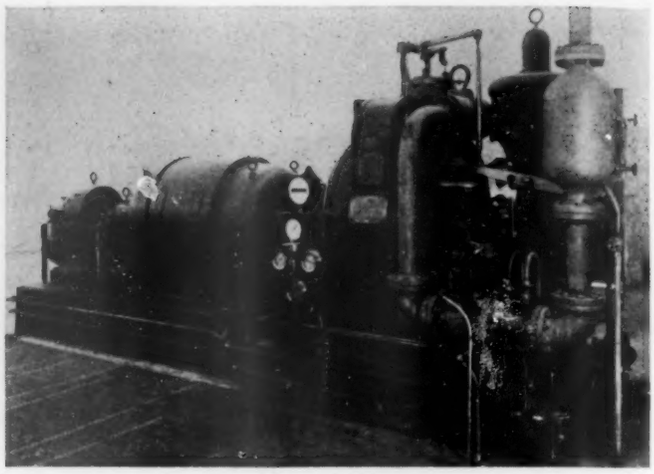
The clinker goes to a 12,000-ton (70,000 bbl.) storage of which 8,000 tons is indoors. Belt-conveyors are used to reclaim the clinker to the two mill-feed hoppers under which are Hardinge Feedometers.

One grinding circuit consists of a 7- by 6- by 26-foot Traylor 2-compartment mill which has its first compartment in closed circuit with a vibrating screen. The second compartment is ordinarily in closed circuit with a 16-foot air separator, but this is not being used at present. Part of the material through the above screen also goes to a 5- by 22-foot Allis-Chalmers tube mill. The second circuit consists of an Allis-



Train-load of stone with Diesel locomotive in front of crushing and storage buildings at Lagunas plant.

The two 5- by 22-foot compartment mills used for raw material and clinker grinding, respectively, in the Lagunas plant.



The 635-kw. Westinghouse turbo-generator which supplies part of the power for the Lagunas plant.

Chalmers No. 8 Gates ball mill followed by a 5- by 22-foot Allis-Chalmers tube mill.

In revising the present grinding setup the present 7- and 6- by 26-foot Traylor clinker mill will be moved to the raw department and the 6- by 24-foot Allis-Chalmers raw mill will go to the clinker department. An 8- by 8-foot Mine & Smelter Marcy mill will be installed in the clinker department for preliminary grinding and this, with a vibrating screen in closed circuit, will be ahead of the above Allis-Chalmers mill. The Marcy mill is being used temporarily in the clinker grinding department in closed circuit with the air separator and followed by a 6- by 22-foot tube mill which came from the Montreal plant of the Canada Cement Company.

The cement is stored in 2,000-ton (11,700 bbl.) silos and sacking is done with a 4-spout Bates packer.

All power used by this plant is now purchased but the supply has been low at times. For this reason the company, in cooperation with the Cuauhtemoc Brewery and the Vidriera Monterrey (glass works) and their subsidiaries, are building a 17,500-kw. steam generating plant to insure an adequate and continuous source of power.

The officers of this company are: Matias Elizondo, president; Adolfo Zambrano, Jr., secretary. Jesus Barrera is general manager, John C. Seelig is general superintendent and chief engineer, and Juan Yunes is chemist.

Cementos Atoyac, S. A., Puebla, Puebla

The plant of Cementos Atoyac, S. A., at Puebla, Puebla, when built in 1920 had one 6- by 60-foot kiln and a capacity of 3 tons of standard Portland cement daily. In 1928 a 6- by 133-foot kiln was added and in 1929 an 8- by 133-foot kiln was installed. In 1943 another 8- by 133-foot kiln was added and the original 60-foot kiln was lengthened to 133 feet. This brought the plant up to its present capacity of 400 tons (2,340 bbl.) of Portland pozzuolan cement daily. With each kiln additional equipment was also installed. In 1943 these additions included two Mine & Smelter Marcy ball mills—1 for raw and 1 for finish grinding—a new packhouse and modernization of the quarry and crushing plant. Air separators were once used in the raw and clinker-grinding departments but these have been removed. The "Atoyac" brands of cement are made.

When this plant was built it used a deposit with a cement rock similar to that in the Lehigh Valley. This was worked out in 1930 and a new high-calcium quarry was opened up

The 178½-foot rebuilt kiln at the Lagunas plant which has new rings, sections and rollers.

3 kilometers (2 miles) from the plant. All drilling and quarry car loading was done by hand until recently. Now Chicago Pneumatic air drills are used and the stone is loaded by hand into skip buckets which are hauled by three Dempster Dumpsters to a ramp from which the stone is loaded into 12-cu. yd. Western side-dump cars. The cars of stone are hauled by electric trolley locomotives to the plant.

The Williams No. 6 Jumbo-hammer-mill primary crusher is in closed circuit with a Robins vibrating screen. This equipment crushes the stone, clay and gypsum. The original installation of two Allis-Chalmers Gates No. 10 gyratory crushers, screen and Williams hammer-mill is held in reserve. The crushed stone goes to three of four 200-ton silos and the clay goes to the fourth.

Schaffer Poidometers feed this material to an 8- by 75-foot rotary drier which uses waste heat from one of the kilns. The dried material goes to a 500-ton silo from which it is fed into the two 8-foot Marcy ball mills. These are followed by three 5- by 22-foot tube mills and their fine product goes into two 600-ton silos.

There are 20-ton feed bins over the four 133-foot Vulcan kilns, two of which are 6 feet and two are 8 feet in diameter. The 6-foot kilns have 5- by 40-foot coolers. All the kilns have natural draft except the one supplying heat to the drier. There are three 150-foot stacks, one of which serves the two 6-foot kilns.

A drag chain conveys the clinker to a 3,000-ton pit in the storage which has a 10-ton Whiting overhead traveling crane. The clinker and 2 per cent. of gypsum are fed by Poidometers to the 8-foot Marcy preliminary ball mill which is followed by five 5- by 22-foot tube mills.

The finished cement is carried by screw conveyors and bucket elevators to three 550-ton (3,200 bbl.) concrete silos. Two of the silos have packers under them. The cement from the third silo goes to the two

2-tube Bates packers in the new packhouse. A belt conveyor loads the sacked cement into cars or trucks. The packing equipment is connected to a Norblo dust collector.

Most of the equipment in this plant is driven through Gates V-belts and the conveyor and flat belt drives are Hewitt. Jeffrey conveyors and Link-Belt elevators are used. Monterrey Steel Co. grinding balls and Chicago Pyrasteel kiln ends are used.

The history of the equipment used in this plant is interesting. The Marcy mills and most of the tube mills — which were formerly rod mills — came from Mexican metal mines. The drier and one of the 8-foot coolers came from the old Lehigh plant at New Castle, Pennsylvania. One of the 8-foot kilns came from the Longview-Saginaw lime plant in Alabama and the other from an old smelter at Saulte Ste. Marie, Canada.

Alton J. Blank is general manager of this company, John A. Blank is consulting engineer, Francisco Santillana is superintendent and Oscar Grados is chemist.

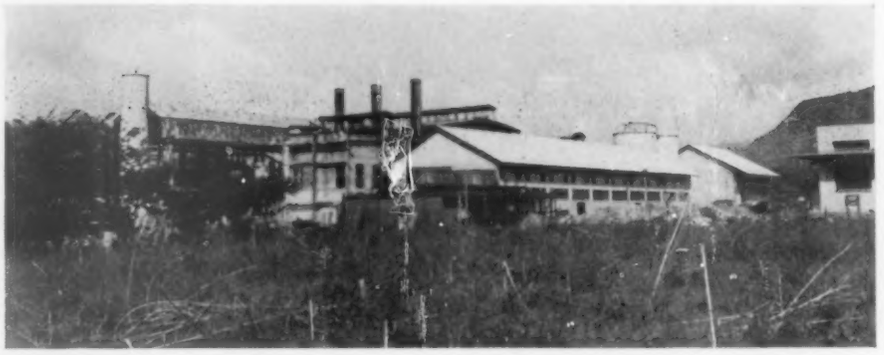
Cementos Portland Nacional, S. A., Hermosillo, Sonora

The original 1-kiln, 120-ton (100 bbl.) wet process plant of Cementos Portland Nacional, S. A., at Hermosillo, Sonora, was described in the

The 2-tube packer in the Lagunas plant.

February 25, 1931, issue of PIT AND QUARRY, shortly after it went in operation.

This plant is in the basin of a large power and irrigation dam under construction and is being moved to a new location at Government expense. The power produced by this dam will solve the company's power problems. This move will also put the plant nearer its glory-hole quarry and a 2,000-foot belt-conveyor will be installed to carry the stone. In rebuilding, the plant capacity will be increased to 250 tons (1,465 bbl.) daily. The present 8- by 150-foot kiln will be extended to



General view of the nearly completed plant of Cementos Veracruz, S. A., near Orizaba, Veracruz.

Charles E. Phillips, construction superintendent, and V. E. Metcalfe, manager of the Veracruz plant.

290 feet with a new Traylor kiln section which will include a 9- by 40-foot calcining zone. Two new Traylor mills will supplement the two original 6- by 22-foot Traylor 2-compartment raw and finish mills and a Fuller grate-type cooler will be installed. Several Fuller-Kinyon pumps will also be installed, including one of the pneumatic-tired under-silo types. The concrete work will again be done by the Macdonald Engineering Company. Two more Worthington Diesel engines will supplement the three original 360-hp. units in the power plant.

Officers of the company are: Ignacio Soto, Jr., secretary-treasurer; Luis Soto, general manager; Antonio Leyva, general superintendent; and Armando C. Quijada, plant chemist. This company uses the "La Campana" brand.

Cementos de Mixcoac, S. A. San Pedro de Los Pinos, D. F.

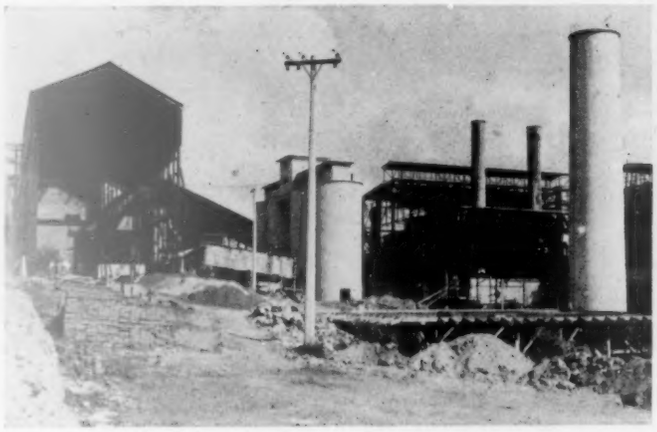
In 1931 the Associated Portland Cement Company, which owns the Tolteca plant, built the original Allis-Chalmers 1-kiln dry process plant of Cementos de Mixcoac, S. A., at San Pedro de Los Pinos, D. F., a suburb of Mexico City. In 1940 the second kiln, a Lepol unit, was installed and other improvements were made. The third kiln, a new Allis-Chalmers unit, was in operation in 1944 and at the same time an Allis-Chalmers grate cooler and other equipment was installed. The capacity of this plant is now 750 metric tons (4,400 bbl.) of standard Portland cement daily, making it the largest plant in Mexico. High-early-strength and masonry cements are also made in this plant with the "Tolteca" brand.

The raw materials used consist of limestone, brought about 65 km. (40 miles) by rail from the Tolteca quarry, and tepetate (volcanic clay) from a deposit near the plant. These materials are fed from the track hoppers to the No. 7½ Allis-Chalmers Gates primary crusher which is followed by a Deister Concentrator Co. Plat-O vibrating screen and a No. 5 Williams Jumbo hammer-mill. The raw materials go to a storage building which holds 3,000 tons of clinker.

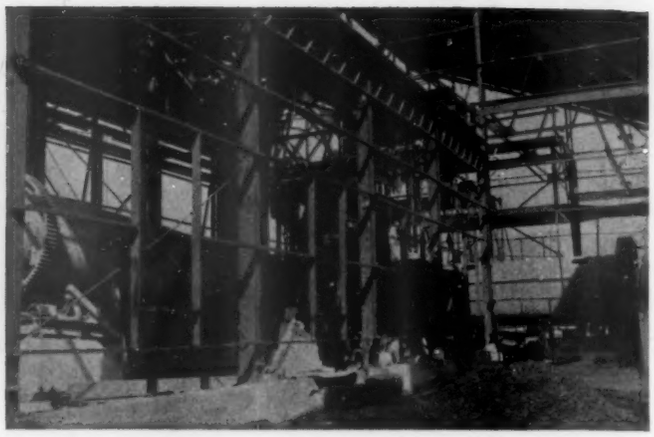
A P&H overhead crane feeds the stone and clay to hoppers over three Allis-Chalmers waste-heat driers. Two 7- by 70-foot driers use waste heat from the No. 1 kiln and the 11½- by 55-foot drier from the No. 3 kiln.

The dried materials are conveyed to pits in the crane yard from which they are fed by the crane to bins over the two No. 360 Babcock & Wilcox raw mills. These are fed by Schaffer Poidometers and are in closed circuit with 16-foot Sturtevant separators. Each mill is also connected to a Norblo dust collector. An 8-inch Fuller-Kinyon pump conveys the product into four blending silos ahead of the kilns.

The No. 1 kiln, a 9-, 10-, and 8- by 285-foot Allis-Chalmers unit is followed by an 8- by 80-foot rotary



Another view of the Veracruz plant showing the storage building, the raw-material blending silos and the kiln-feed building.



In this view of the Veracruz plant are shown the 6- by 60-foot drier, at left, and one of the two compartment mills.

cooler. The No. 2 Lepol kiln is fed nodulized raw material and has a 90-foot rotary section with a 2.3- by 10-meter grate. This is followed by a 1½-by 60-foot rotary cooler. The new 9½- and 11- by 300-foot Allis-Chalmers kiln (No. 3) has a 4½- by 60-foot Allis-Chalmers grate cooler. All the kilns have induced draft fans to individual stacks and are fully instrumented.

Each kiln, when installed, had its own Western Precipitation Cottrell collecting unit. These are being supplemented by a Norblo bag collector which is thought to be one of the first of this type to be installed for the collection of stack dust.

The clinker is discharged on a heat-resisting belt-conveyor with a Merrick Weightometer which records the amount stored.

The clinker and gypsum are fed by the crane to hoppers from which Schaffer Poidometers feed to the two Allis-Chalmers 8732 Compeb mills. These are in closed circuit with 16-foot Sturtevant separators.

Fuller-Kinyon pumps feed the cement into the four storage silos which, with their interspace, have a total capacity of 4,000 metric tons (23,440 bbl.). In the packhouse there are two 3-spout Bates packers and a belt-conveyor is used to load into cars or trucks.

The masonry cement is also made to A. S. T. M. specifications. A local pozzuolanic tuff is added to the other raw materials and the processing is done with the same equipment.

The officers of this company are the same as those at Tolteca. Nicolas B. Borda is plant manager.

Cia. Mexicanos de Cemento Portland "Apasco," Apaxco, Hidalgo

When the plant of Cia. Mexicano de Cemento Portland Apasco, at Apaxco, Hidalgo, went into operation in 1938 it was a Krupp plant throughout, and is one of the two plants in Mexico containing any substantial amount of equipment not of United States manufacture. When a second kiln and accompanying equipment was installed in 1943, the capacity of this plant was increased from 100 to 200 tons (590 to 1,180 bbl.) of standard Portland cement per day. This was at one time reputed to be one of the lowest-cost plants in Mexico, largely due to certain material advantages. Its location only 45 miles northwest of Mexico City is another advantage.

The limestone for this plant comes from a quarry on a hill near the plant with its floor 150 feet above plant level. Manual drilling and loading methods are used and the loaded cars of stone run by gravity to the incline to the plant. Turntables are used to divert the cars to either track of a gravity balanced skip system.

Another quarry of stone with a higher iron content has been opened near the plant level and this is being blended with the other to make a better and faster-setting cement. The finished cement has a surface area of up to 1900 sq. cm. per gm. and exceeds all strength requirements.

There are two hammer-mills, one a Krupp and the other locally made. In wet weather, the crushed stone goes to bins feeding the two 6- by 35-foot rotary driers. The Krupp drier is oil fired and the Allis-Chalmers drier uses waste-heat from the Allis-Chalmers kiln.

The clay is hauled in trucks from a pit 1 mile away. Since the new quarry was opened less clay is required. It is run through the same two driers.

The stone is discharged from the driers to bins over a set of five Williams hammer-mills before going to the three raw-grinding tube mills—a 5½- by 30½ foot Krupp and two 5- by 22-foot Allis-Chalmers. The fine raw material then goes to four blending silos equipped with mechanical mixers before going to the kiln-feed bins.

There are two rotary kilns—a 6½- by 8- by 140-foot Krupp and an 8- by 145-foot Allis-Chalmers. Both have 6- by 40-foot rotary coolers. The 300-degree-F. clinker is discharged on a Goodrich hot belt conveyor from which a tripper distributes it into a 6,000 ton storage building.

At present the clinker is reloaded manually into cars but a tunnel reclaiming conveyor is to be installed. The clinker goes to two grinding circuits, one consisting of a 5½- by 30-foot Krupp tube mill and the other of a Mine and Smelter Marcy mill followed by a 5- by 22-foot Allis-Chalmers tube mill. The finished cement is carried by screw conveyors and an elevator into a 2,000-ton (11,700-bbl.) capacity concrete silo. A Bates 3-tube packer is used and shipments are made in cars and trucks.

The plant is located on the open sewer from Mexico City to a river and the sewage furnishes most of the power for the plant. A 1,000-kw. turbo-generator of German manufacture was installed when the plant was built. About an equal amount of power is now being purchased. A second turbo-generator of 2,660 hp. is to be installed and this will make the plant self-sufficient even after a contemplated third complete unit of crushers, mills, kiln, etc. is installed.

Federico Garcia Cuellar is president and general manager of this company and Fernando Gomez is assistant manager. Jose E. Linares is plant superintendent.

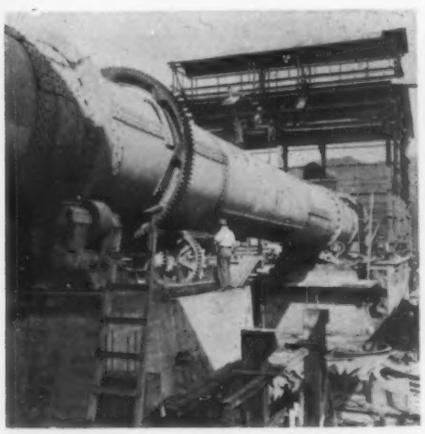
Impulsora de Cementos, S. A., La Junta, Jalisco

The plant of Impulsora de Cementos, S. A., at La Junta, 8 km.

(5 miles) northeast of Guadalajara, Jalisco, was described in the July, 1944 issue of PIT AND QUARRY not long after it went in operation. This plant, like many of the others built in recent years, is hampered by the lack of suitable equipment and has also suffered more than most from the lack of adequate transportation facilities for its raw materials and fuel oil. As a result this plant has never reached its designed capacity of 200 metric tons (1,170 bbl.) daily but equipment now being installed should help make this possible. When operating at capacity, this plant should produce 5,200 tons (3,050 bbl.) of Portland pozzuolan cement and 2,000 tons (11,700 bbl.) of masonry cement monthly. These will be made separately or at the same time. When I visited this plant it was unable to grind more cement because the silos were full and no paper sacks could be obtained. The "Mojonera" brand is used.

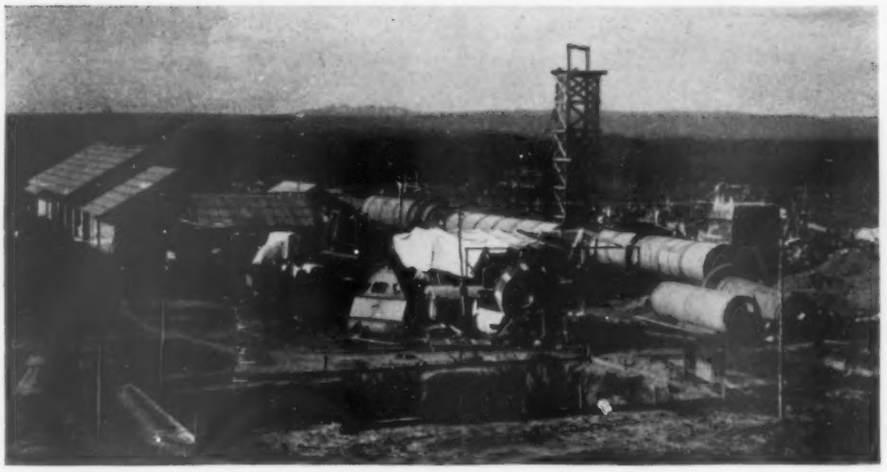
Of some historical interest perhaps is the variety of sources from which the equipment for this plant was obtained. The two 6- by 120-foot kilns and two of the compartment mills came from the old Castalia, Ohio plant. Three tube mills came from the Buffington plant of Universal Atlas. The drier also came from a U. S. plant and the 7- by 135-foot kiln came from a Mexican metal mine. A second drier and three more tube mills which are being installed, also came from Universal Atlas plants and were originally intended for the Leon plant.

The limestone is hauled from the deposit at Huescalapa, 165 km. (103 miles) north of the plant, over the National Railways by a company-owned locomotive and cars. Burned lime was at first used in the



One of the two 8- by 121-foot kilns being erected at the Veracruz plant.

manufacture of Portland pozzuolan cement but this cement is now made from a mixture of Portland cement and a local pozzuolanic material known as "jal." A mortar cement is being made from these same materials, also from the company's own formula.



The plant of Cementos del Pacifico, S. A., which is under construction at Mazatlan, Sinaloa, on the west coast of Mexico.

The man-size stone goes first to a Williams hammermill but a primary crusher has been installed at the quarry so that smaller stone can be shipped. Clay and jal found on the plant property are hauled ½ km. to the plant by Dempster Dumpsters. The existing 7- by 5½- by 60-foot drier is being supplemented by another unit. The original 2-stage grinding system consisted of a 6- by 8-foot Bonnot mill followed by two 5- by 27-foot compartment mills. Later model mills will replace and supplement these.

The two 6- by 120-foot kilns have a common stack and the 7- by 135-foot Vulcan kiln has another. Natural draft is used. The two small kilns have 5- by 50-foot Allis-Chalmers rotary coolers and the large kiln has a 6- by 60-foot cooler.

The clinker grinding was originally done in two stages by an 8-foot by 30-inch Hardinge conical mill followed by three 5- by 22-foot tube mills. Additional mills will replace or supplement these. The cement is stored in four 350-ton (2,050 bbl.) concrete silos and the packing is done by two Bates 2-tube packers.

Piers M. Williams is general manager of the company, George P. Horn — formerly of Longhorn — is superintendent, and L. E. Hetrick — also formerly at Longhorn—is chief chemist.

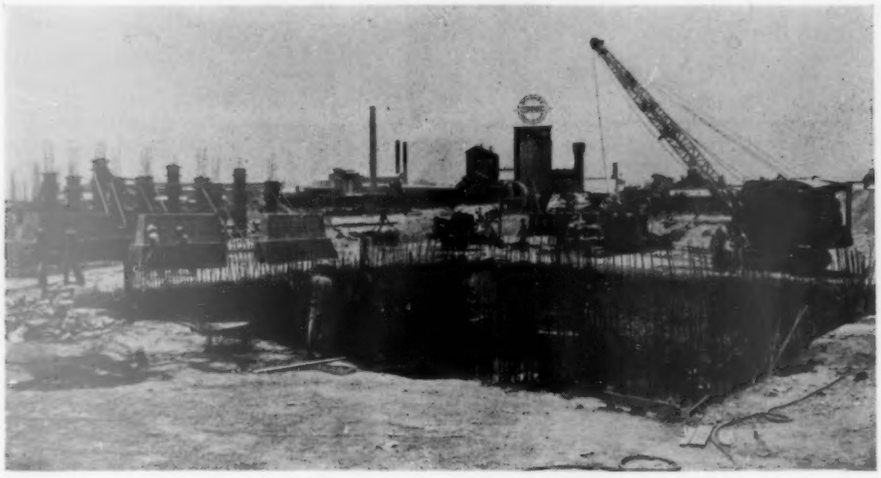
Cooperativa Manufacturera de Cemento Portland "La Cruz Azul", Lagunas, Oaxaca

The new plant of Cooperativa Manufacturera de Cemento Portland, S. C. L., "La Cruz Azul," at Lagunas, Oaxaca is small, having a capacity of 80 metric tons (470 bbl.) of standard Portland cement daily, but it is notable for its modern design and construction and for the high percentage of new equipment involved. This plant, located in a tropical setting over 400 miles southeast of Mexico City, went in operation in November, 1944. Arcadio Hernandez is also manager of this plant which also uses the "La Cruz Azul" brand.

The limestone deposit is only 200 meters (700 feet) from the plant and will be worked mechanically when equipment becomes available. The shale deposit, only 650 meters (2,000 feet) from the plant, is also being worked manually. These materials are hauled to the plant in cars by a 10-ton Plymouth Diesel locomotive over a 3-foot gauge track. After being weighed on a 30-ton Howe track scale these materials are discharged into a track hopper. The stone, shale, and gypsum from a deposit 200 kilometers away are handled separately.

Under the hopper is a pan feeder over a No. 3-A Allis-Chalmers Pulverator. An elevator then feeds each material into one of three 200-ton bins. A 5-ton overhead crane with a Blaw-Knox clamshell bucket feeds the shale, or the limestone in wet weather only, to a 135-ton bin over a 5⅓- by 58½-foot rotary drier. An elevator feeds the dried material back into the main 400- by 50-foot storage building which has a capacity at present of 800 tons of dried shale, 1,800 tons of limestone, 400 tons of gypsum and 1,700 tons of clinker.

The shale and stone are fed from storage into two bins feeding the 5- by 22-foot Allis-Chalmers Compeb mill used for raw grinding. Table feeders are used. The 85 per cent.-through 200-mesh finished raw material is carried by screw conveyors and an elevator into two 600-ton



This picture, taken early in June, shows the progress which has been made on the plant of Cementos del Norte, S. A., at Monterrey, Nuevo Leon.

silos which are equipped for mechanical recirculation for blending and have air agitation.

A tunnel screw conveyor under the silos carries the blended raw material to a 48-ton bin from which a special feeder discharges it into the kiln.

The 6-, 6½-, 8-, and 6- by 178½-foot kiln is an assembled job made from kilns and coolers from the Jasso plant with four new Allis-Chalmers kiln rings and sections and roller supports. It is completely instrumented with an Allis-Chalmers control board which includes bin-level lights, automatic sequence starting and stopping, draft control, etc. Natural draft is furnished through a concrete stack which is 180 feet high and 6 feet in diameter at the top. The kiln is oil fired and a fuel ratio of 20 per cent. is being obtained but this is expected to be reduced to about 17 per cent. Space has been left for a second kiln.

The clinker is discharged to a Fuller cooler with a 3½- by 13½-foot grate. A drag chain conveyor feeds the clinker to an elevator to the storage building.

The same overhead crane feeds the clinker and gypsum to bins with table feeders to the 5- by 22-foot Allis-Chalmers finish-grinding mill. This is located alongside the raw mill which differs only in the size of its grate opening. Space has been left for air separators over each of these mills and for two more mills in each department.

The 90 per cent. minus 200-mesh cement is carried by screw conveyors and elevators into two 600-ton concrete silos—a third is under construction. These are also equipped for mechanical recirculation or blending if desired. A screw conveyor carries the cement to a packhouse in which is a 2-tube St. Regis Modern packer.

The power for this plant is provided by a steam-generating plant. A 500-hp. B & W oil-fired boiler at present supplies all the needed steam with two 300-hp. B & W boilers in reserve which will provide for future expansion of the plant. The power is provided by a 750-kw. Allis-Chalmers and a 635-kw. Westinghouse turbo-generator. A 40-hp. Diesel generator provides emergency power for kiln operation. Other facilities include spray cooling ponds, laboratories, repair shops, etc., and a new town for the 120 plant employees.

Cementos Veracruz, S. A., Orizaba, Veracruz

When it goes into full operation soon the plant of Cementos Veracruz, S. A., near Orizaba, Veracruz, will be the twelfth producing plant in Mexico. Its capacity will be 200 metric tons (1,170 bbl.) of standard Portland cement daily. Formerly the state of Veracruz, one of the richest in the Republic and one of the largest users of cement, had to get its cement by rail from plants up to 275 miles away or by water from New Orleans. The new plant will fill the needs of this and several adjoining states and a considerable area along the Gulf Coast.

The site 200 miles east of Mexico City and about 60 miles inland (west) of Veracruz was selected after extensive surveys by engineers and chemists of Cementos Atoyac, S. A., and the Marquette Cement Manufacturing Company which entered into the venture as a partnership. Under this arrangement most of the equipment required came from the old Hawkeye plant at Des Moines, Iowa, which had been replaced by a new plant a few years ago (see PIT AND QUARRY, July, 1943). This equipment included driers, kilns, coolers, mills, waste-heat boilers, etc. Most of the other equipment such as conveyors, elevators, motors, etc., is new.

The limestone deposit is an existing quarry four miles in one direction and the shale comes from a pit one mile in the opposite direction from the plant. A natural spring provides several times the amount of water needed. Add to this the fact that the plant is at an elevation of 4,000 feet in a tropical setting of banana, orange and coffee trees and an attractive picture presents itself. A further step toward self-sufficiency is the fact that waste-heat boilers make this plant independent of the power shortages which occur during the annual dry seasons.

A 6-inch Sanderson Cyclone well drill and jackhammers will be used in the quarry and a 1¾-cubic yard Marion No. 37 electric shovel will load into 20-cubic yard Kilbourne & Jacobs steel side-dump cars. These

The new plant of Cementos Anahuac at Barrientos, near Mexico City, which is now reported to be in operation.

will be hauled by a 55-ton G. E. Diesel-electric locomotive.

The shale will be drilled with the same equipment but a ⅜-cu. yd. Orton gasoline shovel will load the cars.

The limestone and shale will be discharged separately from the cars into a track hopper from which a Stephens-Adamson pan conveyor will feed a Pennsylvania Type SXT-5-42 hammer-mill. The minus ¾-inch material is elevated into the crane storage building which is 40 feet by 294 feet and has a capacity for 2,400 tons of limestone, 800 tons of shale, 1,000 tons of limestone ballast and aggregate, and 1,750 tons of clinker.

The 7½-ton Milwaukee crane has a 1½ cu. yd. Hayward clamshell bucket and this feeds the stone and shale into 100-ton mill-feed bins. A belt-conveyor and a bucket elevator feed the proportioned mixture into a 6- by 60-foot drier which is connected to a Western Precipitation Multiclone collector. The dried material goes to an 80-ton feed bin over the 8- by 36-foot Traylor compartment mill used for raw grinding.

A 7-inch Fuller-Kinyon pump feeds the ground raw materials into four 300-ton concrete blending silos. A screw conveyor and elevator feed from these to the two 40-ton kiln-feed tanks. The two 8- by 121-foot kilns, like the drier, are equipped with low-pressure oil burners.

The clinker is discharged into 6- by 60-foot coolers and a drag-chain conveyor carries it to the storage building.

Each of the two kilns is connected to an 800-hp. Edgemoor waste-heat boiler and there is an auxiliary oil-fired boiler of the same make and size. Following the waste-heat boilers are draft fans driven by 150-hp. motors and these exhaust to 40-foot steel stacks. The power unit is a 2,500-kw. G. E. turbo-generator.

The gypsum and clinker are fed from storage into bins over the 8- by 7- by 47-foot Traylor compartment mill. Both mills are driven by 900-hp. Crocker-Wheeler motors served by the same 1,500-kw. G. E. 2,300-volt a.c. to 250-volt d.c. generator.

The finished cement is conveyed by the same 7-inch Fuller-Kinyon pump into the two 700-ton (4,100 bbl.) concrete silos. A screw conveyor and elevator feed the cement through a rotary screen into the bin over the 3-tube St. Regis packer. A belt-conveyor feeds the loaded sacks either to cars or trucks.

A Norblo bag-type dust collector serves the packhouse and a similar installation is connected to the two grinding mills.

V. E. Metcalfe is manager at this plant and Charles E. Phillips is construction superintendent.

Cementos Portland del Bajio, S. A., Leon, Guanajuato

The 450-ton (2,640 bbl.) per-day dry-process plant of Cementos Portland del Bajio, S. A., which is being built a few miles from Leon, Guanajuato, is expected to be in operation about January 1, 1946. As construction was begun in January, 1945, this is very good progress under present conditions. It is being built almost entirely of used equipment in good condition which came from the Hannibal, Hudson, Northampton, Buffington and Duluth plants of the Universal Atlas Cement Company.

This plant is compactly and efficiently designed and when completed should compare favorably with the better plants on this continent. It was designed by the Leonard Construction Company of New York and Chicago and is being built under the direction of E. S. Tillotson, chief engineer and construction manager, who formerly worked for Leonard. J. B. Harris, superintendent of erection, and Cecil Ring, assistant superintendent, were formerly with Universal-Atlas. W. A. McCanless, formerly production manager of the Yosemite Portland Cement Company, will be plant superintendent. Jose Rivera, who is well known in the States, is general manager of the company which has its main office in Mexico City.

The raw materials for the plant are an excellent grade of limestone and clay. The limestone deposit is 14 kilometers (9 miles) from the plant and the clay is on the plant site. Mechanical recovery and handling methods will be used.

The rock will be discharged from cars into the 30-inch Allis-Chalmers McCully gyratory primary crusher. A Tyler Ty-Rock screen will divert the coarse rock to the 10-inch McCully reduction crusher but it will also be used for making commercial crushed stone. There is a 6,000-ton rock storage ahead of the 6-foot 5-inch by 88-foot 4-inch rotary drier. The dried rock will be stored in 4 of 6 concrete silos which are 20 feet in diameter and 50 feet high.

The clay will be discharged from trucks into a pile and bulldozed to a double-roll crusher. After going through a drier identical with the rock drier the clay will be stored in the other two silos.

Apron feeders will rough blend the rock and clay as they are drawn out of the silos into bins. Merrick Weightometers will record the amount of raw material withdrawn to a Williams hammer-mill in closed circuit with a Tyler Niagara screen. This material will then be stored in five concrete silos from which the final blend will be made.

The grinding will be done by ten 5- by 22-ft. tube mills, five for preliminary and five for final grinding. A Fuller-Kinyon pump will convey the finished raw materials into five 20-foot diameter by 55-foot high concrete silos from which the final blend for the kilns will be made.

Two of the three kilns are 8½- and 10-feet in diameter by 150-feet long and one is 9 feet in diameter by 142 feet long. All will have draft fans, steel stacks and modern automatic control equipment.

The clinker will be discharged from the three 6- by 80-foot rotary coolers to drag chain conveyors feeding the clinker storage. This will have a capacity of 30,000 barrels of clinker and 50 tons of gypsum. These materials will be reclaimed separately on a belt-conveyor in a concrete tunnel and fed to bins. A Symons cone crusher in closed circuit with a Tyler Niagara screen will reduce the clinker.

The gypsum and clinker will be stored in five sets of mill-feed bins. The grinding will also be done in two sets of five 5- by 22-foot tube mills each. Fuller-Kinyon pumps will convey the finished cement to six 20- by 85-foot concrete silos in two rows with two interstices.

Tyler screens will remove lumps, etc., from the cement before it goes into bins over the Bates packers.

In designing the plant, space has been left for the later installation of additional equipment to double the present capacity. There will also be bag storage and shop buildings.

Cementos del Norte, S. A., Monterrey, Nuevo Leon

The blast furnace slag-Portland cement plant of Cementos del Norte, S. A., is located near the plant of Cementos Mexiconos in the outskirts of Monterrey. The backers of this plant felt that there is a demand in this territory for cheaper cement which will make a concrete strong enough for many purposes where high early strength is not necessary, such as foundations, dams, etc. Extensive tests were made during the past two years with mixtures of slag and cement clinker ranging from 25 - 75 per cent. to 75 - 25 per cent. It was found that the 75 per cent. slag mixture when ground to a surface area of 1,600 cm.² per gram gave a low 7-day strength but

(*Continued on page* 129)

MODERN TEXAS CEMENT PLANT'S POLICY OF PROGRESSIVE METHODS SHOWS RESULTS

View of San Antonio Portland Cement Company plant office building.

another ON THE SPOT report

THE early history and development of the Alamo Portland and Roman Cement Company, the first Portland cement plant established west of the Mississippi and the second such plant to be built in the United States, were reviewed in the March, 1945, issue of Pit and Quarry. The present discussion will

Primary crushing is done in a one-cubic-yard hammermill.

cover in more detail the important developments and production methods at the company's modern plant at Cementville, Texas, now known as San Antonio Portland Cement Company, just outside the city limits of San Antonio and about five miles from the heart of the business section. Construction began at this site in 1908, the same year in which the present corporate name was adopted, when the old Alamo Portland and Roman Cement Company determined to abandon the quarries which had been operated on a lease arrangement with the city of San Antonio in what is now Brackenridge Park.

There is virtually no overburden on the company's quarry deposit, which ranges from extremely hard limestone to a soft cement rock. The rock analysis in carbonates runs from 65 to 90 per cent. ($Ca\ CO_3$). SiO_2 runs from 13.5 per cent. in the cement rock to 6.1 per cent. in the hard limestone. All blasting holes are drilled with Loomis and Bucyrus-Erie well drills. The rock shatters readily and on a relatively straight face, although some trimming is done, using an Ingersoll-Rand portable compressor and drill.

The quarry face is about half a mile long and describes a circular arc with the maximum height of around 70 feet in the center. A narrow-gauge track laid out in a loop on the quarry floor parallels almost the entire face so that proper blending of the rock may be accomplished with two 50-B Bucyrus-Erie steam shovels working at various positions along the circuit. The 7-ton side dump cars are hauled in 4-car trains by two 12-ton gasoline locomotives — 1 Plymouth and 2 Whitcombs are used interchangeably—to the crusher, a round trip of approximately a mile. The rock is dumped into a hopper from which it is fed by means of a pan and a belt-conveyor to the Williams Jumbo 36-inch hammermill.

In 1923 the plant was converted to the wet process without effecting any material increase in capacity. The original raw-grinding compartment mill was supplemented by a 7-foot by 45-foot Traylor compartment mill preceded by a pug mill. A 7- by 30-foot F. L. Smidth tube mill also installed at this time is now being operated in conjunction with a 9- by 8-foot Traylor ball mill in

By WILLIAM M. AVERY

closed circuit with the screen classifiers. In connection with the change-over to the wet process, Wilfley pumps were installed to handle the slurry, the clinker storage building was enlarged, and many other important changes were made.

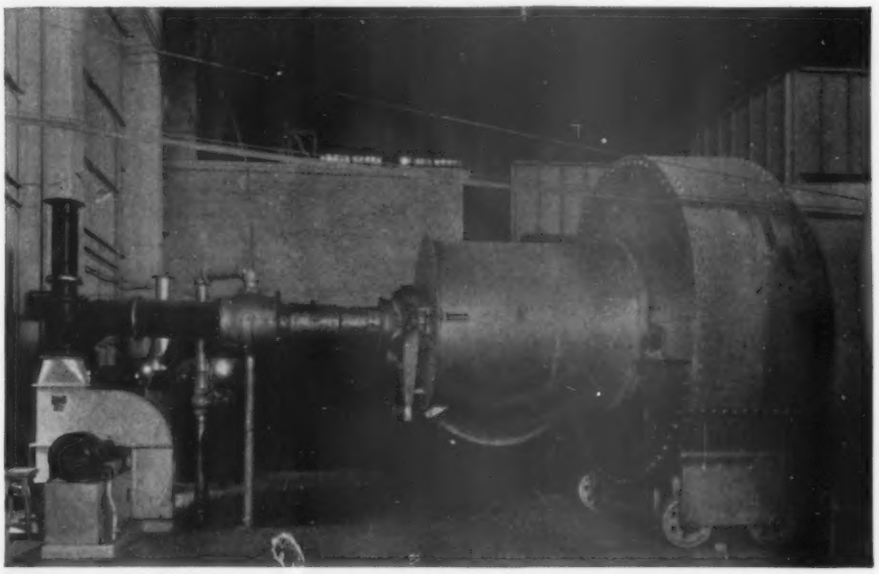
The finish-grinding department was further expanded in 1936 by the installation of an 8- by 50-foot Traylor four-compartment mill for the production of high-early-strength cement, and the following year the 9- by 8-foot Traylor ball mill was installed in connection with the 7- by 45-foot raw mill for primary grinding in closed circuit with the screen classifiers. Traylor table feeders are now used on both finishing mills.

The company's primary purpose in converting to the wet process was to eliminate dust in the plant and to prevent damage to surrounding property. Subsequently dust collectors were installed in the mill-room and pack-house and in the kiln and

AGAIN AWARDED BY THE
PORTLAND CEMENT ASSOCIATION
TO SAN ANTONIO PORTLAND CEMENT COMPANY
FOR A PERFECT SAFETY RECORD
DURING 1927 - 1930

The P.C.A. safety trophy won four times by the plant since 1923.

The 9- by 8-foot ball mill used for preliminary clinker grinding.



Feed end of kiln, showing hot air flue and bustle connection to hood.

Discharge ends of coolers, showing method of installation.

cooler department, with the result that the plant buildings and yards are now remarkably free of dust nuisance. All these installations were made by the Northern Blower Company.

Through the years San Antonio Portland's farsighted management has maintained a comprehensive improvement program at Cementville, making from time to time the changes that seemed desirable in the light of experience and judgment and the steady progress in the technology of cement manufacture.

Remarkable results have been obtained at this plant through the installation of two Lee Process Clinker coolers which were placed in operation in September, 1933. These are 40-foot units connected to two Traylor 9- by 10- by 220-foot rotary kilns using natural gas as fuel. A third kiln—an 8- by 10- by 220-foot Traylor — was equipped with the Lee Process cooler several years later. These coolers have proved very satisfactory and have effected a saving in fuel.

Before the installation of the coolers hot clinker was discharged directly from the kilns into a Link-Belt Peck bucket-carrier which transferred it to the open-storage building, where the clinker was sprayed with water and seasoned before being fed to the finish-grinding mills. Now the clinker leaves the Lee coolers at a temperature of about 150 degrees F., and is fed to a 14-inch Cement Mill Equipment drag conveyor which takes it to the storage building. A 10-ton Shepard overhead traveling crane with a 4-cubic-yard Hayward clamshell bucket serves the storage building and the finish grinding mills. It is interesting to note that the grindability of the clinker now being produced is better than was formerly the case when grinding to the same fineness, and higher strengths are being obtained. The temperature of the kiln combustion air is now about 1,100 degrees F., compared with former near-atmospheric temperatures.

At the time the coolers were installed F. L. Smidth synchronized variable-speed kiln feeders were added. These are of the Ferris-wheel type and are driven by synchronous motors operated by electricity produced by generators on the kiln motors. This type of control keeps the rate of slurry feed in direct proportion to the kiln speed and puts the control of the feed ratio entirely into the hands of the kiln burner. Foxboro instruments record the amount of combustion air entering the kiln through the clinker beds in the coolers and in-

General view of the San Antonio Portland Cement Company plant buildings near San Antonio, Texas.

sure a steady flow regardless of variations in the depth of the clinker. The coolers and drag-chains are individually driven through Palmer-Bee speed-reducers.

The company has always generated its own power at Cementville. Seven solid-injection full-Diesel engines drive individual direct-connected generators, producing 440-volt, 3-phase, 60-cycle current to operate the entire plant. These units, which range from a 640-

A 14-inch drag-conveyor transports hot clinker to the storage building.

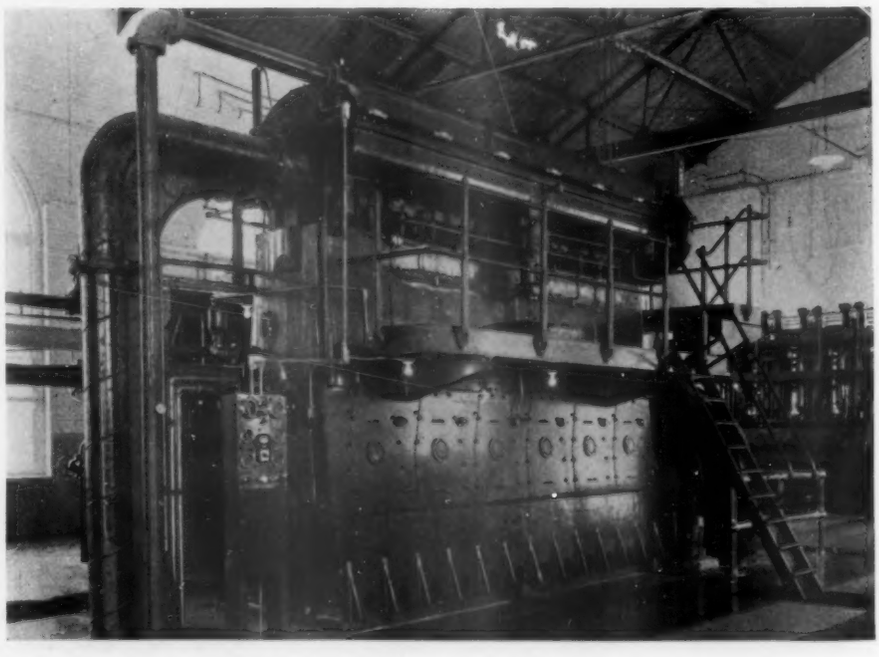
horsepower Busch-Sulzer to a 2,000-horsepower Rathbun-Jones engine installed in 1936, total 8,200 horsepower, and during peak operations the full generating capacity of the power plant is required. The engines burn 26-28 Baume gravity fuel oil. Fuel oil is stored in underground tanks which were formerly used for supplying oil to the kilns before the introduction of natural gas.

A new Binks enclosed-type jacket cooling system has just been installed. The system has a capacity of 3,300 gallons per minute, and the heat-exchanger coils are located in the base of the 20- by 140- by 15-foot tower. Prior to this installation all the engines except the one most recently purchased — 1939 — were cooled by circulating water from an open pond. A Zeolite water softener with a 120-cubic-foot supply tank is in use.

In the near future the company plans to install an entirely new Westinghouse switchboard, and to provide each of the generators with an exciter and voltage regulator.

An interesting experiment in practical democracy was undertaken by the company when the position of plant manager was abolished in 1938. Since then the plant has been operated by a committee composed of the heads of the various departments, who meet each morning for a discussion of operating problems. J. R. Kogay is chief chemist, William Tasto, superintendent, G. A. Witte, chief mechanic, Richard Rodriguez, chief electrician, and L. C. Michell, chief engineer in charge of the power plant.

Charles Baumberger, Sr., still actively directs the company of which he became president on its incorporation. On October 28 of this year Mr. Baumberger will celebrate 65 years of continuous service with the San Antonio Portland Cement Company and the former Alamo Portland and Roman Cement Company, his association with the business having begun a few months after the original incorporation of the Alamo Portland and Roman Cement Company in 1880. Widely honored now as the dean of cement-plant executives in the country, Mr. Baumberger is particularly proud of his company's outstanding safety record. In 1923 the Cementville plant was the first winner of the Portland Cement Association's safety trophy, and re-awards were made for perfect safety records in 1927, 1930 and 1931.



One of the seven solid-injection full-Diesel engines which drive the generators.

Chloroform Soluble Content Control of Air-Entraining Portland Cements

By E. S. ERNST and R. A. LOVELAND
Chief Chemist, Former Research Engineer
Dewey Portland Cement Company

another P and Q exclusive

THE use of air-entraining Portland cements is expanding rather rapidly and, as a result, more and more cement chemists have been confronted with the problem of devising methods and means for controlling the chloroform-soluble content of the cements produced in their plants. This problem is made up of two parts, only one of which will be touched on in the present article. They are, first, the development of means of measuring out, or feeding, the chloroform-soluble material to the grinding units in the proper proportion to the other ingredients of the cement, and, second, the development of methods for the quick estimation of the amount added. The present paper deals with the latter problem.

A.S.T.M. specifications C-175-42T and EA-150 limit the amount of chloroform-soluble material permitted in Portland cements to .025 per cent. to .045 per cent. Field conditions, such as varying concrete mixtures, mixing times, types of concrete mixer, etc., add further limiting factors through their effect on the amount of air entrainment produced with given percentages of chloroform-soluble content. All this contributes to the necessity for rather close control being exercised over the production of this type of cement.

It has been found that many factors, such as the type of admixture feeder, the grinding circuit, the type of dust-collector used, etc., affect the proper control of the amount and distribution of the chloroform-soluble material.

The A.S.T.M. method (C114-42) for the determination of the chloroform-soluble content of Portland cement is rather long and somewhat tedious and not readily adapted to control testing which involves many and frequent tests. A quicker and reasonably-accurate control method is therefore desirable.

Such a method has been used for some time by the writers and, while no originality is claimed for the basic idea of the method, it is hoped that the following description of the procedure used in its improvement may prove interesting as well as useful to others confronted with a similar problem.

The chloroform-soluble content of cement is generally taken as a measure of the materials which are purposely or inadvertently added to cement during processing and promote the entrainment of air in concrete or mortar during the mixing period.

The substitution of air for liquid or solid constituents of a concrete mix has the effect of lowering its unit weight. This effect has been used in the field as a means of measuring the air content of concrete and at least one highway department has used it as a means for the detection of the use of certain grinding aids of which it did not approve.

The Method The method to be described here is essentially one of obtaining the weight per liter of a mortar which is made with fixed proportions of cement, water and sand and under controlled conditions of mixing and placing, after which the percentage of chloroform-soluble content of the cement corresponding to this weight can be picked from a previously-prepared curve. Several steps must be taken, of course, before this curve can be plotted, the first of which is the selection of the gradation of sand to be used in the mortar.

It has been observed that the mortars used in cement testing—notably 1 to 2.77 graded Ottawa sand mortar (A.S.T.M. C109-37T), 1 to 3 standard sand mortar (A.S.T.M.

Table I—VOIDS IN VARIOUS SAND COMBINATIONS

R-1 Cement (%)	R-4 Cement (%)	Liter Weight (*grams*)	Flow	Air Voids (%)	Chloroform Soluble (%)
0	100	2,150	140 in 16 drops	4.1	.0371
12.5	87.5	2,157	140 in 16 drops	3.7	.0333
25.0	25.0	2,165	140 in 20 drops	3.4	.0296
37.5	62.5	2,168	140 in 18 drops	3.2	.0260
50.0	50.0	2,179	140 in 18 drops	2.8	.0222
62.5	37.5	2,185	140 in 18 drops	2.5	.0185
75.0	25.0	2,199	140 in 18 drops	1.9	.0148
87.5	12.5	2,204	140 in 17 drops	1.6	.0111
100.0	0	2,217	140 in 18 drops	1.1	.0074
R-2 Cement (%)	R-3 Cement (%)				
0	100	2,158	140 in 22 drops	3.7	.0513
12.5	87.5	2,163	140 in 23 drops	3.5	.0462
25.0	75.0	2,175	140	2.9	.0411
37.5	62.5	2,178	140	2.8	.0360
50.0	50.0	2,187	140 in 22 drops	2.4	.0309
62.5	37.5	2,192	140 in 21 drops	2.2	.0258
75.0	25.0	2,199	140 in 21 drops	1.9	.0207
87.5	12.5	2,209	140 in 21 drops	1.4	.0156
100.0	0	2,218	140 in 19 drops	1.0	.0105
R-6 Cement (%)	R-4 Cement (%)				
100	0	2,212	135	1.3	.0098
96	4	2,210	140	1.4	.0108
92	8	2,202	140	1.7	.0119
87.5	12.5	2,198	140	1.9	.0132
75.0	25.0	2,196	140 in 24 drops	2.0	.0166
62.5	37.5	2,187	140 in 23 drops	2.4	.0200
50.0	50.0	2,184	140 in 23 drops	2.5	.0234
37.5	62.5	2,168	140 in 24 drops	3.2	.0269
25.0	75.0	2,165	140 in 22 drops	3.4	.0303
12.5	87.5	2,162	140 in 20 drops	3.5	.0337
0	100	2,147	140 in 21 drops	4.2	.0371

R-1 and R-2 are regular Portlands.
R-3 and R-4 are air entraining Portlands.
R-6 is a high-early-strength cement.
Note: All above mixes:

800 Cement
400 Water
600 Banding sand
1,200 Standard sand

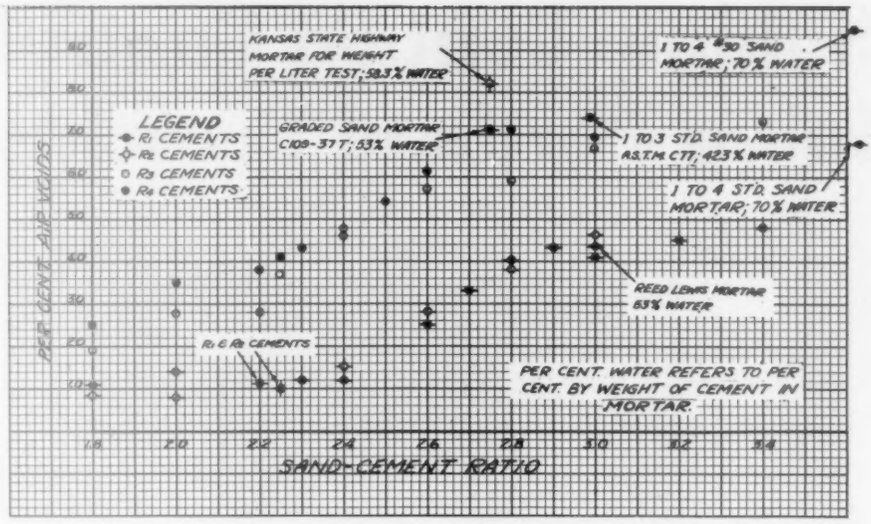

KANSAS STATE HIGHWAY MORTAR FOR WEIGHT PER LITER TEST; 58.3% WATER
1 TO 4 #30 SAND MORTAR; 70% WATER
LEGEND
R1 CEMENTS
R2 CEMENTS
R3 CEMENTS
R4 CEMENTS
GRADED SAND MORTAR C109-37 T; 53% WATER
1 TO 3 STD. SAND MORTAR A.S.T.M. C77; 42.3% WATER
1 TO 4 STD. SAND MORTAR; 70% WATER
REED LEWIS MORTAR 65% WATER
R1 & R2 CEMENTS
PER CENT. WATER REFERS TO PER CENT. BY WEIGHT OF CEMENT IN MORTAR
PER CENT AIR VOIDS
SAND-CEMENT RATIO

Figure 1.

C77-40), 1 to 4 standard sand mortar and the E. W. Reed-Lewis testing mortar—entrain a considerable proportion of air even with Portland cement containing no air-entraining agent. (Refer to Figure 1.) The fact that ordinary cement concrete does not usually entrain more than 1 per cent. or so of air indicates that the air voids in the above mortars might be reduced by a better sand grading or by varying the mix proportions, or both. Our first efforts were directed, therefore, toward obtaining a reasonably dense sand mixture since it was also felt that the elimination of as much inherent air from the mixture as possible would be beneficial and thereby make the test more dependent on the air entrained as an effect of the chloroform-soluble material present.

The Materials Standard Ottawa sand, graded Ottawa sand and a third Ottawa sand (banding) were selected for trial combinations. These sands were selected because the first two are readily available in cement-testing laboratories and the third is easily obtainable from the same source as the first two. Banding sand is a fine sand produced from the St. Peters sandstone by hydraulic mining, washing, drying and screening and will largely pass through 50-mesh. The banding sand that we used had the following screen analysis:

	Per Cent.
Passing the 50-mesh	99
Retained on the 100-mesh	74
Retained on the 200-mesh	96
Retained on the 325-mesh	97

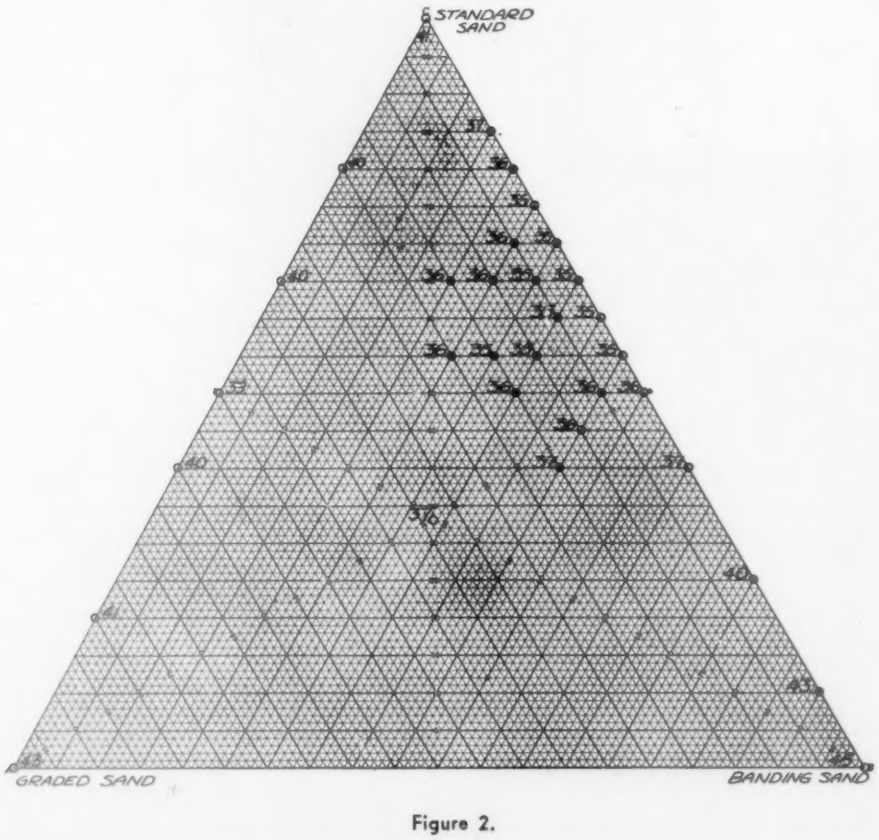


Figure 2.

The Procedure In determining the proper proportions of these three sands it was assumed that the best combination for our purpose would also have the lowest voids when measured by the loose-volume method. The loose-volume method was preferred to the rodded-volume method because it appeared to approach more nearly the condition of the sand in the mortar. The method of test was as follows:[1]

Weigh proportions of the different sizes of sand totalling 1,800 grams. Mix them by rolling and then place the mixture in a cloth sack about 5 inches in diameter and 21 inches in length. Close the top of the sack with one hand and hold the bottom with the other. The sand is mixed by forcing it from one end of the sack to the other by alternately raising and lowering each hand about 10 times in 20 seconds. Then place the open end of the sack in a liter measure (approximately 3 inches in diameter), pushing it to the bottom of the measure while it is in a horizontal position. Slowly raise the measure and sack to the vertical position and withdraw the sack slowly from the measure without vibration. Strike off the top of the measure with the same care as to vibration and obtain the net weight of the sand.

Void Calculations:

$$V = 100\frac{W_s - W_1}{W_s}$$

Where,

V = the percentage of voids in loose sand,

W_s = the bulk specific gravity (A.S.T.M. C 127-42)

and W_1 = the net weight of the sand combination per milliliter.

Example:

A mixture of 35 per cent. banding sand and 65 per cent. standard Ottawa sand (prepared according to the above method) weighed 1.72

[1]This method was adapted from that used by the Texas Highway Department in their bulletin C-10.

grams per milliliter. The bulk specific gravity (W_s) was 2.63.

$$V = 100\frac{(2.63 - 1.72)}{2.63} = 36.6$$

per cent. voids.

The investigation of various combinations of these sands indicated that the sand mixture with the lowest percentage of voids contained approximately 1 part of banding sand and 2 parts of standard sand and that no other combination of the sands including graded sand had a lower percentage of voids. (See Figure 2 and Table I.). The 1 part banding sand to 2 parts standard sand was therefore chosen as the sand combination best suited for the mortar-density tests.

Table II—MORTAR DENSITIES—VARIABLE SAND TO CEMENT MIX

Cement	Sand-Cement Ratio	Liter Weight (*grams*)	Flow	Voids (%)
R-1	1.8	2,172	.....	1.1
R-2	1.8	2,175	140 in 12 drops	0.9
R-3	1.8	2,153	140 in 20 drops	1.9
R-4	1.8	2,140	140 in 11 drops	2.5
R-1	2.0	2,187	.....	1.4
R-2	2.0	2,200	140 in 14 drops	0.8
R-3	2.0	2,158	.....	2.75
R-4	2.0	2,140	140 in 10 drops	3.5
R-1	2.2	2,212	.....	1.1
R-2	2.2	2,210	140 in 17 drops	1.1
R-3	2.2	2,173	.....	2.8
R-4	2.2	2,151	140 in 16 drops	3.8
R-1	2.25	2,217	140 in 18 drops	1.0
R-2	2.25	2,218	140 in 19 drops	1.0
R-3	2.25	2,158	140 in 22 drops	3.7
R-4	2.25	2,148	140 in 16 drops	4.1
R-1	2.3	2,218	140 in 17 drops	1.2
R-2	.....	.....	.....	.....
R-3	.....	.....	.....	.....
R-4	2.3	2,150	140 in 17 drops	4.3
R-1	2.4	2,226	.....	1.2
R-2	2.4	2,220	140 in 22 drops	1.5
R-3	2.4	2,150	.....	4.6
R-4	2.4	2,147	.....	4.7
R-1	.....	.....	.....	.....
R-2	.....	.....	.....	.....
R-3	.....	.....	.....	.....
R-4	2.5	2,140	140 in 21 drops	5.4
R-1	2.6	2,212	140	2.5
R-2	2.6	2,206	130	2.8
R-3	2.6	2,140	.....	5.7
R-4	2.6	2,130	140 in 23 drops	6.1
R-1	2.7	2,202	.....	3.3
R-2	.....	.....	.....	.....
R-3	.....	.....	.....	.....
R-4	.....	.....	.....	.....
R-1	2.8	2,193	.....	4
R-2	2.8	2,198	120	3.8
R-3	2.8	2,150	.....	5.9
R-4	2.8	2,123	130	7.1
R-1	2.9	2,193	.....	4.3
R-2	.....	.....	.....	.....
R-3	.....	.....	.....	.....
R-4	.....	.....	.....	.....
R-1	3.0	2,203	.....	4.1
R-2	3.0	2,213	105	3.6
R-3	3.0	2,143	105	6.7
R-4	3.0	2,138	125	6.9
R-1	3.2	2,208	.....	4.5
R-2	.....	.....	.....	.....
R-3	.....	.....	.....	.....
R-4	.....	.....	.....	.....
R-1	3.4	2,205	.....	4.8
R-2	.....	.....	.....	.....
R-3	3.4	2,152	.....	7.3
R-4	.....	.....	.....	.....

Note: All above mixed have 50 percent. water by weight of cement, and sand combination is 1 part banding to 2 parts standard Ottawa.

2.77	2,170	.....	8.2[1]
2.77	2,100	100	7.1[2]
3	2,176	135	4.4[3]
3	2,177	57	7.4[4]
4	2,032	100	9.5[5]
4	2,095	110	6.7[6]

[1] Kansas density test mortar 58.3% water by weight of cement.
[2] See A.S.T.M. C109 37T for proportioning and mixing—53% water.
[3] Reed-Lewis mortar 2 parts cement, 1 part banding sand, 3 parts standard Ottawa, and 2 parts No. 30 sand—53% water by weight of cement.
[4] 1 to 3 standard sand mortar A.S.T.M. C77-40—42.3% water by weight of cement.
[5] 1 to 4 No. 30 sand mortar; 70% water by weight of cement.
[6] 1 to 4 standard sand mortar; 70% water by weight of cement.

Table III—RELATION OF MORTAR DENSITIES AND CHLOROFORM SOLUBLE
Mixtures of Air-Entraining Cements and Regular Cements Holding Mix Proportions Constant

A Banding Sand (%)	B Graded Sand (%)	C Standard Ottawa Sand (%)	D Wt/CM	E Solid (Wt/CM=Sp. Gr.)	E-D	Voids (%) $100\frac{E-D}{E}$
100	0	0	1.44	2.63	1.19	45.3
90	0	10	1.49	.....	1.14	43.4
75	0	25	1.57	.....	1.06	40.4
60	0	40	1.65	.....	0.98	37.3
50	0	50	1.69	.....	0.94	35.8
45	0	55	1.70	.....	0.93	35.4
40	0	60	1.71	.....	0.92	35.0
35	0	65	1.72	.....	0.91	34.6
30	0	70	1.71	.....	0.92	35.0
25	0	75	1.70	.....	0.93	35.4
20	0	80	1.68	.....	0.95	36.2
15	0	85	1.66	.....	0.97	36.9
0	0	100	1.55	.....	1.08	41.1
33⅓	33⅓	33⅓	1.65	.....	0.98	37.3
25	20	55	1.67	.....	0.96	36.5
0	100	0	1.51	.....	1.12	42.6
0	80	20	1.55	.....	1.08	41.1
0	60	40	1.58	.....	1.05	40.0
0	50	50	1.60	.....	1.03	39.2
0	35	65	1.59	.....	1.04	39.6
0	20	80	1.59	.....	1.04	39.6
45	5	50	1.69	.....	0.94	35.8
35	5	60	1.71	.....	0.92	35.0
30	5	65	1.72	.....	0.91	34.6
25	5	70	1.69	.....	0.94	35.8
45	10	45	1.67	.....	0.96	36.5
35	10	55	1.70	.....	0.93	35.4
25	10	65	1.69	.....	0.94	35.8
45	15	40	1.66	.....	0.97	36.9
35	15	50	1.69	.....	0.94	35.8
30	15	55	1.70	.....	0.93	35.4
20	15	65	1.68	.....	0.95	36.2
50	50	0	1.54	.....	1.09	41.5

Sand- and Water-Cement Ratios Having selected the sand combination to be used, the next step was to determine the proportions of sand to cement to be employed. This was done by making a series of mortars covering a range of proportions of cement to the selected sand combination and using a water-cement ratio of 0.50 by weight. See Figure 1 and Table II for the air voids found for these various mortars.

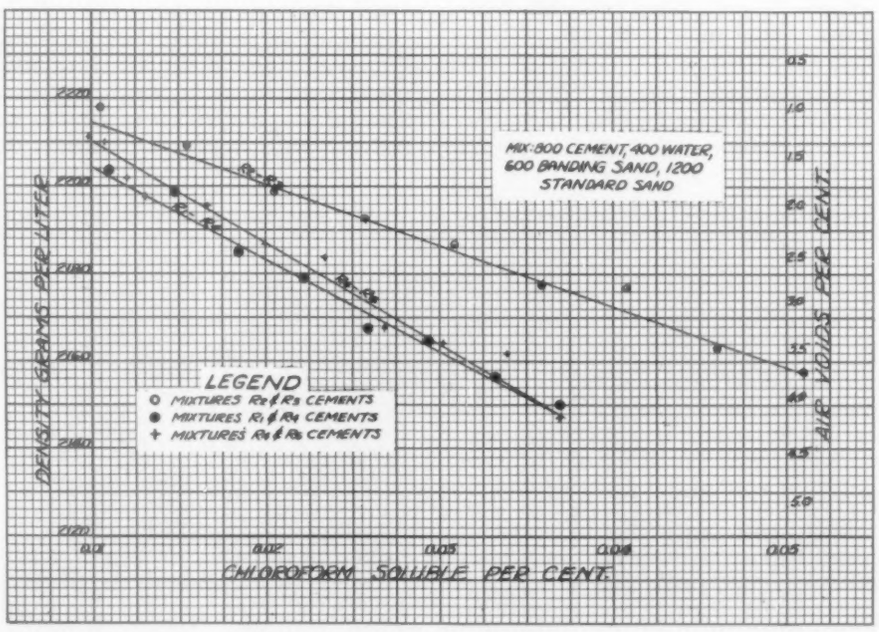

MIX: 800 CEMENT, 400 WATER, 600 BANDING SAND, 1200 STANDARD SAND
LEGEND
MIXTURES R2 & R3 CEMENTS
MIXTURES R1 & R4 CEMENTS
MIXTURES R5 & R6 CEMENTS
DENSITY GRAMS PER LITER
AIR VOIDS PER CENT.
CHLOROFORM SOLUBLE PER CENT.

Figure 3.

A water-cement ratio of 50 per cent. by weight was selected because cement pastes of higher ratios often have excessive bleeding tendencies and because it was near to the popular 6-gallon-per-sack mix used in laboratory testing and in high-grade concrete. Four cements were used for these mortars. Two of the cements, as indicated in Table III, contained air-entraining agents, while the other two were normal Portland cements.

Mortar Density The method of determining mortar density involved the following equipment and procedure:

Apparatus.—Bowl approximately of 1½-gallon capacity made of non-corrosive non-absorbent material. A 1,000-milliliter measure approximately 3 inches in diameter, a 500-milliliter graduate accurate to 2 milliliters at graduations. A straight-edge trowel, a set of weights and scales as per A.S.T.M. C-109-37T, medium-weight rubber gloves, a bullet-pointed rod ½ inch in diameter by 12 inches in length.

Temperature.—Water cement and sand at 70 degrees F. plus or minus 3, and the laboratory 68 to 81 degrees F.

Procedure. — Moisten bowl with damp cloth, add 400 milliliters of water, put in 800 grams of cement, mix for 30 seconds. Add 1,200 grams of standard sand and mix for 1½ minutes. Fill previously-tared liter measure one-third full, tamp 25 times with ½-inch steel rod. Fill to two-thirds full and repeat tamping. Fill to overflowing and repeat tamping. Remove excess mortar with straight-edge trowel and weigh. Record net weight.

It will be noted that the regular mortars contained only about 1 per cent. of air voids over a range of sand-cement ratios of 1.8 to 2.4 but that above a ratio of 2.4 the air voids rose rather sharply. A similar rise in the air voids is noted at about the same ratio for the air-entraining cement mortars. It was, therefore, decided to choose a sand-cement ratio of 2.25 for two reasons. At this ratio the mortars contained air contents similar to those usually found or desired in the respective field concretes made from these two types of cement and small variations in the ratio at this point would disturb the ratio-void relationship much less than would be the case at the higher ratios, where the percentage of voids increased rather sharply, as indicated by the steeply rising curve. It was felt that choosing a ratio falling on the relatively flat portion of the curves would assure less experimental error than would be the case with a higher ratio.

Calculations:

C = weight of cement
S = weight of sand
H = weight of water
G_c = specific gravity cement
G_s = bulk specific gravity sand
W_o = density mortar air free, grams per liter
W_a = density mortar as measured, grams per liter.

$$\text{Then: } W_o = 1{,}000 \left(\frac{C + S + H}{\frac{C}{G_c} + \frac{S}{G_s} + H} \right)$$

$$\text{And, Air Voids percentage} = 100 \left(\frac{W_o - W_a}{W_o} \right)$$

Example:

	Weight Grams	*Absolute Volume*
Cement	800	$\frac{800}{3.15} = 254$ milliliters
Sand	1,800	$\frac{1{,}800}{2.63} = 685$ milliliters
Water	400	$\frac{400}{1} = 400$ milliliters
		1,339 milliliters
		$\frac{}{} = 1{,}339$ liters

$$V_o = \frac{3{,}000}{1.339} = 2{,}240$$

Let $V_a = 2{,}128$

$$\text{Then, } 100\left(\frac{2{,}240 - 2{,}128}{2{,}240}\right) = 5 \text{ per cent. air voids}$$

Table IV—PROPERTIES OF CEMENTS

Property	Cements and Serial Numbers				
	Regular R-1	Regular R-2	Air-Entraining R-3	Air-Entraining R-4	High Early Strength R-6
S102	21.94	20.52	20.62	21.12	.....
AL203	4.74	6.41	6.00	4.95	.....
Fe203	2.74	3.46	3.19	2.91	.....
Mn203	0.56	0.15	0.13	0.56	.....
CaO	62.88	63.59	63.44	63.19	.....
MgO	3.37	1.30	1.31	3.41	.....
SO3	1.68	1.72	2.27	1.77	.....
Loss	1.20	1.70	1.90	1.32	.....
Chloroform Soluble	0.0074	0.0105	0.0513	0.0371	0.0098
Surface (Wagner)	1,757	1,741	1,972	1,807	.....
	1,749	1,738	1,983	1,810	.....
Surface (Lee Nurse)	3,644	3,978	4,402	3,781	6077
	3,693	3,978	4,372	3,787	.....
325 Mesh	92.9	89.9	97.5	95.7	.....
Date:	5/14/44	5/14/44	5/14/44	5/14/44	5/27/44

Liter Weights With the sand combination, water-cement ratio and the sand-cement ratio selected as outlined above, the next step was to establish curves for the liter weight of mortars made from cements containing a range of chloroform-soluble contents. These cements were made by blending a

(*Continued on page* 128)

CANADIAN CEMENT COMPANY BUILDS MODERN STORAGE AND PACKING PLANT

By K. L. MacMILLAN, M. E. R. C.

Chief Draughtsman,
Canada Cement Company

Storage silos and packhouse with water tower in foreground. At right is part of clinker mill.

another P.Q. exclusive

IN 1940 the Canada Cement Company decided to build a modern cement storage and packing department at its Hull, Quebec, plant No. 3 to replace a single low-bin storage. The site for the new packhouse was chosen in close proximity to the clinker-grinding department, and was located so as to use the existing railway track for car shipments at one side of the building, and at the other side to provide sufficient maneuvering space for the loading of auto trucks with trailers having a maximum loading body length of 25 feet.

The site was cleared to solid rock and a foundation slab of 8-inch minimum thickness was poured over the entire area to provide an even base for the erection, by sliding form construction, of a cement storage consisting of six silos each 50 feet inside diameter and two interspace bins, approximately 21 feet square.

Gear reducer drives of the longitudinal and cross screw conveyors under silos.

The total height above the foundation slab is 109 feet 0 inches, giving a storage height of 100 feet after deducting for tunnel space. The total capacity of the storage is 325,000 Canadian (350-pound) barrels. The walls of the storage are 12 inches thick and at the junction of bin walls they are 24 inches thick. The roof slab is anchored to the wall of the interspace bins only, and is free to expand over the top of the outside walls. A combination weather-proof air vent and manhole is located in the roof of each bin.

Individual base-weighted posts are set at intervals over the finished roof covering. These posts support cable guards on either side of the operational space for the cement transport lines. The access to the roof of the silo is by an outside stairway leading from a penthouse on the packhouse roof. Each silo is fitted with a clean-out door which is so placed that any cement spilled out when the door is opened can be discharged into the screw conveyor below. The door is also placed high enough to allow it to be opened without a sudden outward rush of cement, while at the center of the door is placed a 1½-inch diameter air connection.

The bin slabs are supported by continuous walls which form six operational tunnels each 6 feet wide and 7 feet high, discharge outlets are placed at about 18-foot centers and each tunnel has a weather-protected exit porch at its end.

The packhouse is a reinforced-

Right: A 4-tube packer with bag wheels nearly empty. The roller support under table and sliding seat rails are also shown. Below: One of the 4-tube bag packers with bag slide and wheel at left and shuttle conveyor below.

concrete frame structure with 8-inch concrete block walls supported at each floor by the perimeter beams. A steel truss lean-to roof covers the truck loading area; three chain-operated rolling doors are on the truck-loading side and three rolling doors, together with a draw-bridge type car-loading ramp, are on the car-loading side. These ramps are so hinged that in the down position they can be knocked off their swing

Foot pedal releasing bags from center chute leaving both hands free to remove bags.

points without damage if the railroad cars are moved.

All stairs are of concrete 4 feet 10 inches wide 7- by 10-inch slope, with a full tread of 12 inches with 1½- by 1½-inch angle-protected nosing.

Owing to the scarcity of steel, the packhouse was designed to make full use of our own product wherever possible. Cement is pumped from the clinker mill by a 6-inch Fuller-Kinyon pump, Type H, driven by a 50-horsepower 1200-r.p.m. motor through a Falk flexible coupling. Air at 28-pound pressure for the line is supplied by a Fuller rotary air compressor, size C-80 driven through a shear-pin coupling by a 50-horsepower, 1200-r.p.m. motor. This unit is installed alongside the pump. Cement is conveyed by a 5-inch diameter transport line having a horizontal run of 250 feet and a vertical lift of 122 feet, and it distributes the cement to the bins through two 3-way and two 2-way Fuller valves.

Cement is drawn out of the bins by specially designed upper-cut valves which are operated by a lever and can be set to give a fairly accurate feed to the screw conveyors.

The six longitudinal screw conveyors are 16 inches in diameter and 150 feet long, each driven by a 15-horsepower, 900-r.p.m. motor through flexible couplings and a Falk reducer to give a spiral speed of 66 r.p.m. The screw conveyor troughs are made with 4-inch concrete walls; a 4- by 3-inch angle with the 3-inch leg turned up is attached to the top of the walls to take the covers, and the sliding gudgeon hangers. All thrust is taken by a ball bearing thrust collar at the drive end. The drive shaft is mounted on two standard pillow blocks and it passes through a felt-packed end stuffing box to drive the screw.

The steel conveyor covers are held in place with special quick-removing locks, and they are supplied with dust-tight inspection doors between bin gates. The openings are protected with a wire screen and a door near the discharge end of the conveyors has a plate glass top under which a lighted globe gives a fair indication of the amount of cement carried in the trough. The six longitudinal screws discharge into a combined left-and-right-hand 16-inch screw running at 66 r.p.m. The drive and all details are the same as the tunnel screws, but with two ball bearing thrust collars at the drive end. The cross screw discharges into a continuous bucket elevator with 24- by 10- by 11¾ inch buckets on two strands of No. 110 chain, one tail traction 18 inches diameter and 24 inches wide and two 30-inch head tractions, driven by a 15-horsepower 900-r.p.m. motor through flexible couplings and a Falk reducer to give a bucket speed of 125 r.p.m.

The casing is 2 feet 8 inches by 5 feet inside and is built of 4-inch solid concrete blocks. Into it were built two inspection and repair doors at the first floor level. Steel take-up frames and a steel elevator discharge head were attached to this casing.

The elevator discharges on to a 42-inch wide by 8-foot long Dillon vibrating screen with ⅛- by ½-inch clear screen openings. The oversize material chute is housed in with a flexible chute cover to keep the fines from going into this discharge chute. The drive shaft of the screen is carried to the outside of the concrete block housing through a flexible dust-proof seal, and a 2-horsepower, 1800-r.p.m. motor mounted on a spring base drives the screen through a V-belt. The concrete casing is provided with large doors for changing screen cloth.

The screened cement is carried by a 16-inch diameter screw conveyor driven by a 10-horsepower, 900-r.p.m. motor through flexible couplings and a Falk reducer to give a spiral speed of 66 r.p.m. The cement is discharged through two adjustable upper-cut valves and one open chute to the three packing machine bins. The level of the cement in the last bin is indicated by a cable-operated, counterweighted cone float with an indicator on the ground floor.

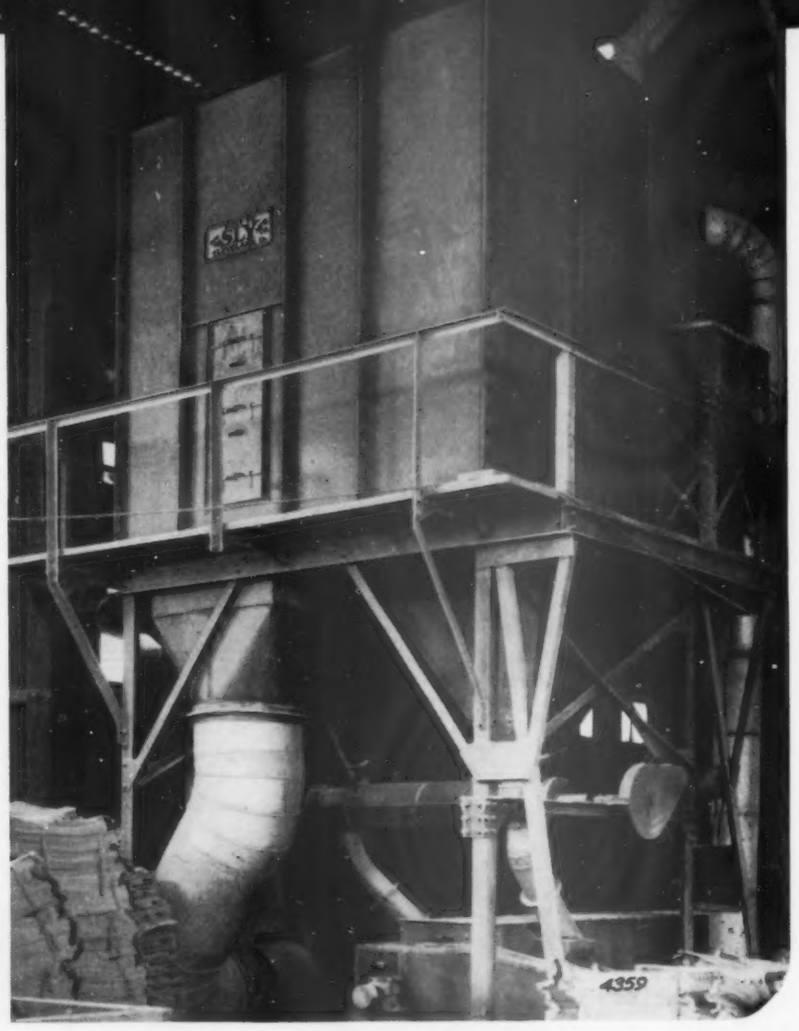
The packing bins are built of reinforced concrete. The inside vertical corners have a 6-inch radius and the corner slope is 65 degrees. The

(*Continued on page* 126)

Car-loading end of shuttle conveyor showing trolley support, drive-chain guard, and safety guard in up position.

Shuttle conveyor extended to load front end of truck. As each row is filled the conveyor is moved back slightly.

SLY *Not Expensive*



This is a typical Sly installation. Literally, hundreds of similar installations are in use in connection with production of cement, crushed stone, agricultural limestone, gypsum, asbestos, talc, feldspar, fluorspar, gold, copper and iron ore, diatomaceous earth, bauxite, etc.

Sly Dust Filters collect dust generated in such operations as crushing, grinding, screening, conveying, loading, separating, and mixing. They comply fully with the requirements of the laws and regulations of the various states.

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Illustration at left shows a Sly Dust Filter in the pack houss of a cement plant. Several dust pipes enter the far side of the filter. The exhaust fan is located on the floor below filter. A screw conveyor automatically and continuously removes the collected cement. Hundreds of similar Sly Filters are used in cement plants and other rock product industries.

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INDUSTRIAL DUST CONTROL

Canadian (from page 124)

capacity is about 200 Canadian barrels. No difficulty has been experienced in feeding the packing machines.

The three packers are St Regis 111 F.C., 4-tube machines with long feeders, each driven by a 20-horsepower, 900-r.p.m. motor. The operator's seat is fitted to a sliding ball bearing roller carriage which permits the operator to move from side to side in front of the machine by pressure from his foot rest. The height and distance of the seat is quite critical but when once fixed it suits most operators. A 5-foot diameter circular, precast concrete, revolving bag magazine is placed on either side of the packing machine. These magazines have a center raised wall to keep the four bundles of bags in a straight position for easy picking, and it also serves to separate bags of different wall thickness.

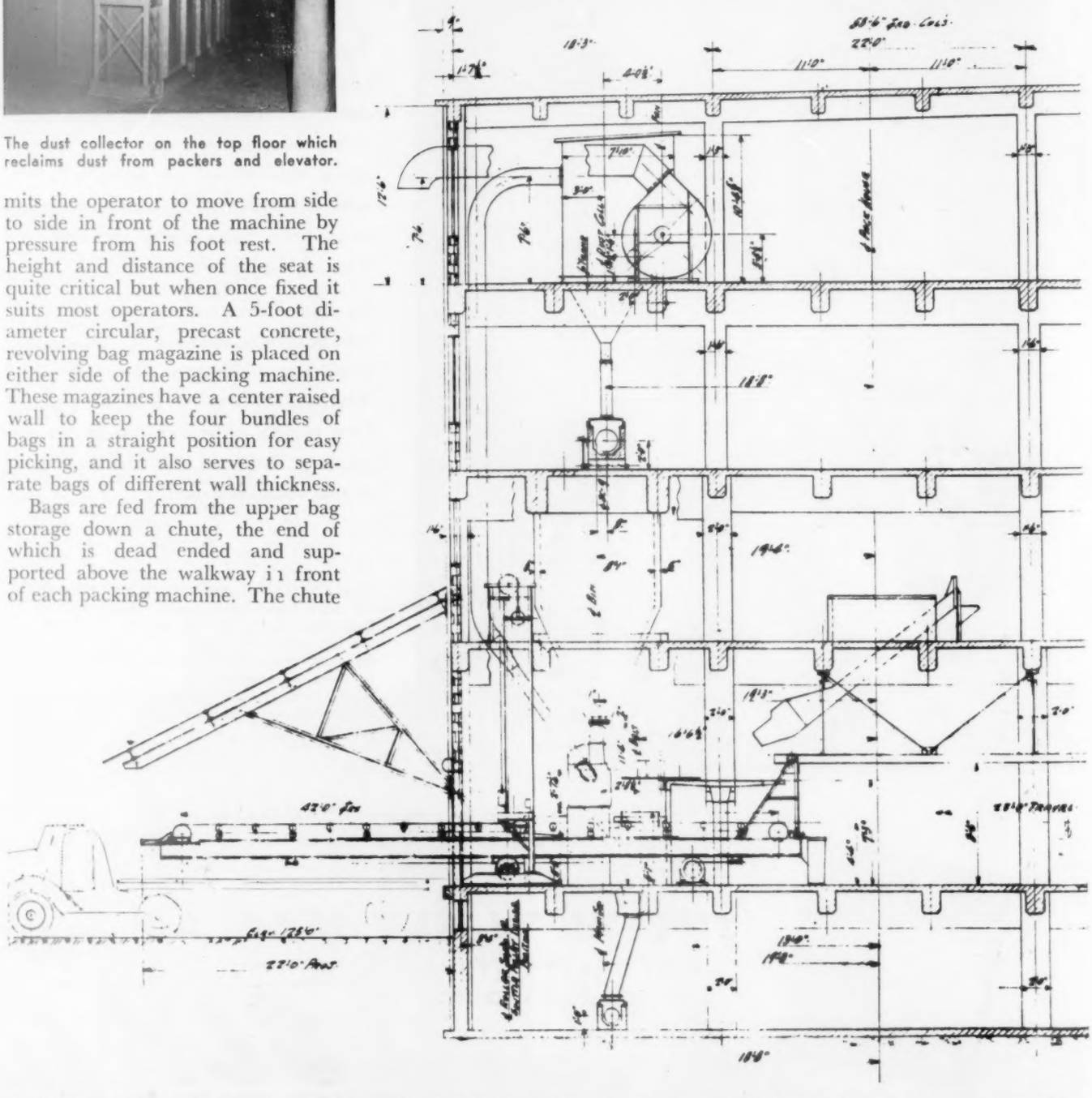
The dust collector on the top floor which reclaims dust from packers and elevator.

Bags are fed from the upper bag storage down a chute, the end of which is dead ended and supported above the walkway in front of each packing machine. The chute has three compartments; the bottom lower end of each has a steel plate hinged bag lifter, operated by a foot lever for removing bags from the chute. The chute was built of concrete, the slope being 38 degrees but all sliding edges were troweled to a smooth finish and ground.

The packed bags drop on to a transfer belt 30 inches wide with head and tail pulleys 12 inches in diameter; all pillow blocks are anti-friction. The belt is driven by a 2-horsepower No. 28 R-1 Falk motor reducer, coupling connected and mounted on a combined movable base with the tail pulley. The belt speed is 110 feet per minute. A cushion block is placed under the top run of the belt. As the bags are carried toward the discharge end in an oblique position, they come into contact with a deflector plate and are straightened so as to roll over on to the shuttle belt straight.

The shuttle consists of a structural steel supporting frame carrying a 24-inch wide endless belt on flat anti-friction idlers. Head and tail pulleys are mounted on anti-friction bearings.

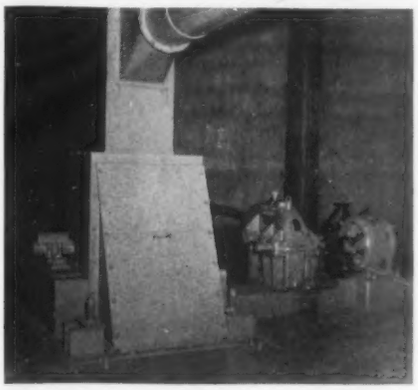
The conveyor belt is driven by a 1½-horsepower Falk motor reducer through roller chain and sprocket to give a belt speed of 117 feet per minute. One end is fitted with a



In this view of the packhouse is shown the arrangement of the bag chutes, the bag wheels, and the shuttle loading conveyors in relation to the packers.

for truck loading which also forms the takeup support for the tail pulley. The other end is fitted with a standard discharge table for hand truck loading to railway cars.

The shuttle frame is supported at one end from an overhead ball bearing trolley running on an I-beam. The other end, so as to project outside the building, runs on two anti-friction-mounted, 19-inch diameter rollers, one of which is double flanged to guide the shuttle frame. Because some of the trucks are covered no overhead support can be used. The shuttle is moved in either direction by a 2-horsepower No. 44 R-1 Falk motor-reducer equipped with motor break; a spiral grooved 12-inch diameter drum is fitted to the drive shaft. At the alternate side of this drum, cables are dead ended so that as one winds up the other unwinds. The other ends of the cables are attached to the ends of the shuttle frame with tension eye bolts. The travel speed is 24.5 f.p.m. In operation the auto trucks remain stationary, the loaders move the shuttle back as each pile is built up.



The elevator drive with dust collector connection to settling box.

The total extension of the shuttle outside the building is 23 feet. All trucks are weighed before and after loading.

Three power wires for the conveyor drive motor, three controls and one interlock wire are carried together in a flexible cable from a stationary outlet box on the frame of a counterweighted take-up to the drive end of the conveyor. The lead-out extension of the cable lies in an angle trough which travels with the shuttle.

The shuttle is provided at each discharge end with a start, stop and reverse button for the belt conveyor control. There is also a forward and backward control button which stops the travel with the release of the finger, and a control for stopping the transfer belt and giving the packer a signal to stop packing. Electric limit trip switches and mechanical stops protect the shuttle from over travel.

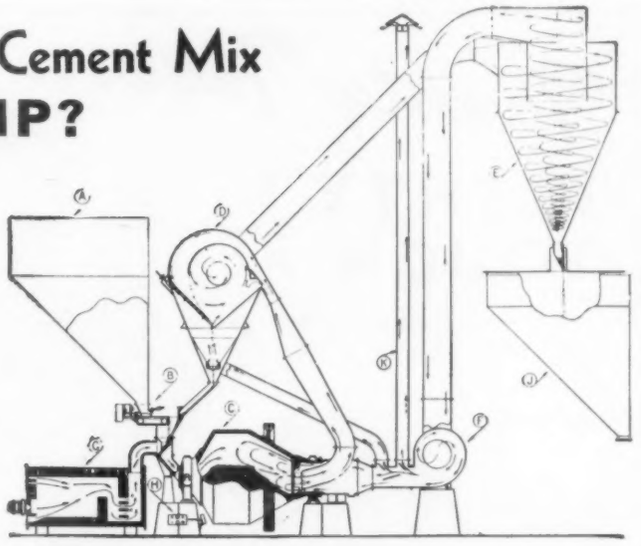
A safety guard is lowered at the car loading end to protect men walking by when the shuttle is being operated from the auto truck loading end.

The average capacity when loading trucks is 200 to 250 barrels an hour and for railway cars it is 250 to 300 barrels per hour.

Two-floor clean-up chutes, each with counter-weighted dust lock, and three tailing chutes from the transfer belt housings discharge into a 12-inch screw conveyor, driven by a 10-horsepower, 900-r.p.m. motor through flexible couplings and a 6 D.B. Falk reducer to give a spiral speed of 65 r.p.m. The screw discharges into the back of the elevator.

Bags are unloaded from railway cars by hand truck and elevated to the different floors by a 4- by 10-foot platform elevator driven by a worm gear hoist. The elevator well walls are built of 4-inch concrete blocks and the control of the elevator is semi-automatic; bags are stored 8 feet high with passage ways left for trucking space.

Your Raw Cement Mix is DAMP?



DRY and GRIND in 1 operation with a HARDINGE THERMOMILL

The Thermomill is a combination of the Conical Mill, Reversed-Current Air Classifier and Air Heater.

This compact unit eliminates a separate dryer and requires little floor space. Product discharged at any height—no elevator required.

Write today for illustrated bulletin No. 13-D.

A—Feed Bin
B—Constant Weight Feeder
C—Hardinge Conical Mill
D—Air Classifier
E—Product Collector
F—Exhauster
G—Air Heater
H—"Electric Ear"
J—Product Bin
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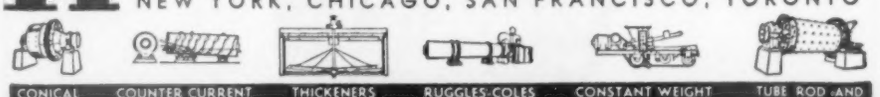


CONICAL MILLS | COUNTER CURRENT CLASSIFIERS | THICKENERS CLARIFIERS | RUGGLES-COLES DRYERS | CONSTANT WEIGHT FEEDERS | TUBE ROD AND BATCH MILLS

The dust is collected from each of the packing machines by two 9-inch diameter pipes each taking 1600 c.f.m. These join together into a 14-inch diameter pipe leading to the collector. From a setting box at the top of the elevator a 15-inch diameter pipe carries 5000 c.f.m. to the same collector. The entire conveying, elevating, and screening system has been made dust tight. Consequently the elevator acts as a pipe to put a negative pressure on the No. 90, Type 360 with motor driven whole system. A Sly dust collector, rotary discharge valves, is located on the top floor. The dust discharges to the feed screw over the packing bins. The exhaust fan is a No. 80 Planovane driven by V-belts to give a speed of 595 r.p.m.

The foreman's office is situated on the first floor. The wash room, lockers, and lunch rooms are in a well-lighted basement. All tunnels and floors are well lighted, all steel work is painted grey, all hand rails and machinery guards are painted red. The packhouse foreman prides himself on having the cleanest department in the plant.

The construction was done by the Carter Hall Company from plans prepared by the engineering staff of the Canada Cement Company, Limited, under the supervision of John Narsted, general superintendent of the company.

Twenty Tons...

PLENTY TOUGH!

MARION BODIES

"HAUL IT AND HAVE IT"

Yes, they can haul up to 20 tons of rock, for they have that specially-engineered construction that makes them ask for more where others would ask for mercy.

The bodies pictured are made with 1/4" steel shell and 2" oak floor under a 3/8" wear plate. They have twin telescopic straddle mount hoists.

Marion offers a full line of dump bodies and hoists. If you require truck bodies of special design, MARION engineers will do your job effectively and economically.

See Your Local Distributor or Write
THE
MARION METAL PRODUCTS CO.
BODY and HOIST DIVISION, MARION, O.

Chloroform Soluble *(from page 122)*

normal cement of known chloroform-soluble content with an air-entraining cement, whose chloroform-soluble content was also known, in the proportions needed to give the desired range. (Refer to Table IV.) Using three blends, as indicated on Table IV, and the method given above, the liter weights (mortar densities) were obtained and plotted against the chloroform soluble contents of the respective blends. (See Figure 3.)

These results indicate a straight-line relationship, for practical purposes, in the range considered in this investigation. By inspection of Figure 3 it may be seen that the average deviation of the points from the curve is equal to about .001 per cent. of chloroform-soluble content, which is not objectionable from a control standpoint.

There is some evidence in these curves that cement fineness as indicated by surface area has some influence on the slope of the curves obtained. It will be noted that the slope of the curve for the R4-R6 cement is steeper than the slope of the curve for the R1-R4 cement mixture. In the R4-R6 mixture the surface area increases to the left and more rapidly than that of the R1-R4 mixture does. In the R2-R3 mixture on the other hand, the curve is flatter. In this case the surface area increases to the right.

It should be noted that these curves are not for general application but, rather, only apply to the specific cements for which they were determined. Thus, a new curve would be required for the product of each different plant. There is some evidence, too, that the age or degree of aeration of the cement has an influence on the type of curve required.

Summary Since the intergrinding of certain chloroform-soluble materials with cement causes the mortar which is made from these cements to entrain air, it was felt that under certain conditions a simple relation existed.

The usual mortars used for testing Portland cement entrain larger proportions of air with regular Portland cements than do concretes made with air-entraining cements. Therefore, the need for a testing mortar which would entrain a negligible amount of air with regular Portland

cement was apparent.

It was believed that this large air content was partly caused by the large percentage of voids in ordinary testing sand and partly by a tendency to segregation due to a lack of finer sand grains. Accordingly various combinations of standard, graded and banding sand from the Ottawa Silica Company were tried in order to obtain a sand with a proportion of fine sizes and minimum air voids. A large number of tests were made the results of which indicated that 1 part of banding sand and 2 parts of standard sand had minimum air voids and that the addition of graded sand in appreciable quantities tended to increase rather than to reduce the air voids.

After the sand combination was determined, it was decided to select a water content equal to 50 per cent. by weight of the cement. Tests of various proportions indicated that 1 part of cement to 2¼ parts of sand gave air voids only a little more than 1 per cent. with regular Portland cement and nearly 4 per cent. with air-entraining cement containing the specification limit of .045 per cent. of chloroform-soluble content.

Using various proportions of regular and air-entraining cements from two widely-separated mills, straight-line relations were obtained between the mortar densities (liter weights) and the chloroform-soluble contents of the cements. The slopes of the lines, however, were not the same, indicating that at least two points should be determined before drawing the curves for other air-entraining cements. The data further indicated that finer cements required more air-entraining agent for a given air content in the mortar.

Mexican Cement (*from page 115*)

compared favorably with Mexican standard Portland cement at 28 days and over. Another important factor was that only a small investment and a small amount of additional equipment is necessary to stretch 100 tons (586 bbl.) of regular cement clinker into the 400-ton (2,340 bbl.) daily output which is expected. The brand name will be "Atlante."

The slag to be used had been wasted by the steel company and its disposal was becoming a serious problem. Only fresh slag from the furnaces will be used and this will be vitrified by water before it can crystallize, resulting in a slag weighing about 45 pounds per cubic foot. This slag will be hauled on a private rail line and dumped on an open storage at the cement plant.

Table feeders and a tunnel belt conveyor will feed the slag to a new 8- by 48-foot Vulcan double-shell rotary drier. The dried slag will go to an 8-foot by 48-inch Hardinge conical mill with three Hardinge Feedometers for cement clinker, slag and gypsum. The mill will be in closed circuit with a vibrating screen. The second stage of grinding will be done in two 6- by 22-foot Allis-Chalmers tube mills which came from the Canada Cement Company's plant in Montreal.

A Fuller-Kinyon pump will feed the finished cement into four concrete storage silos. These will be so arranged that a 50-50 slag-Portland cement can be stored separately for the irrigation commission. The cement will be reclaimed from the silos by a Fuller pneumatic-tired portable pump to a bin over the 8-tube St. Regis bag packer. The sacked cement will be carried on a belt-conveyor to one side of the packhouse for loading into cars and to the other side for trucks. All the elevators, conveyors and motors in this plant will also be new.

Jesus Barrera is president of this company, Edgardo Quiroga is plant superintendent and Juan C. Seelig is consulting engineer.

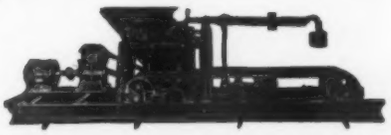
Why CEMENT PRODUCERS rely on Schaffer Poidometers

Correct *blending* is a major factor in cement uniformity—and SCHAFFER Poidometers have been blending both raw and finished material in this field for over 30 years.

SCHAFFER Poidometers are fast, automatic, extremely accurate machines that weigh and record the amount of material fed into the grinding mills or mixing hoppers.

They are designed and built for "non-stop" service under all working conditions, and insure maximum output, product uniformity and operating economy.

Available with remote control recording and operating devices, and total weight recorders.



Over 1000 now serving industry

One of several SCHAFFER Poidometers in the Ludington, Mich., plant of Dow Chemical Co. Poidometer is weighing and feeding dolomite to rotary kilns.

Write for Catalog No. 5

SCHAFFER POIDOMETER CO., 2828 Smallman Ave., Pittsburgh 22, Pa.

Prepare Now for Heavy

NEVER BEFORE have America's cement manufacturers been confronted with so great a demand as that which will come with the peacetime construction programs scheduled to start when hostilities cease.

Many plant executives and engineers have already made plans to install additional equipment necessary to the stepped-up production of cement for industrial and commercial post-war construction.

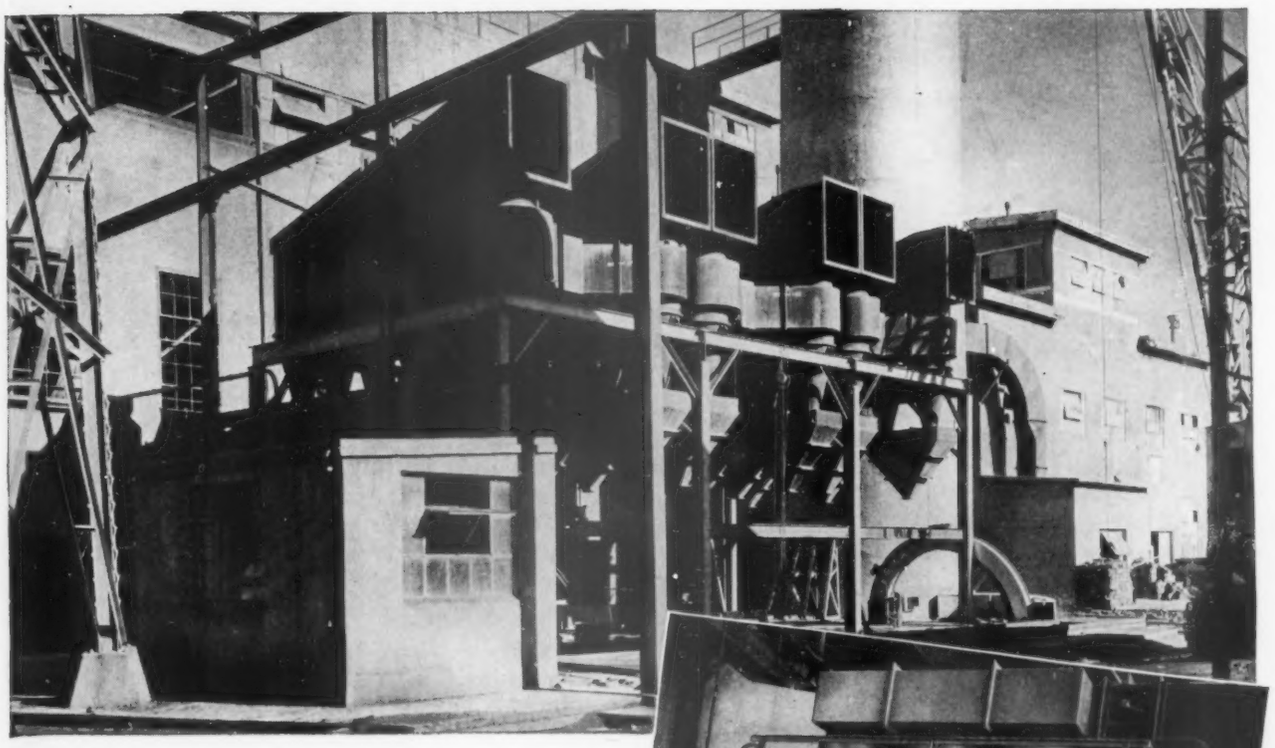
New highways, air fields, power projects and many City, State and Federal construction plans will call for peak cement production for years to come.

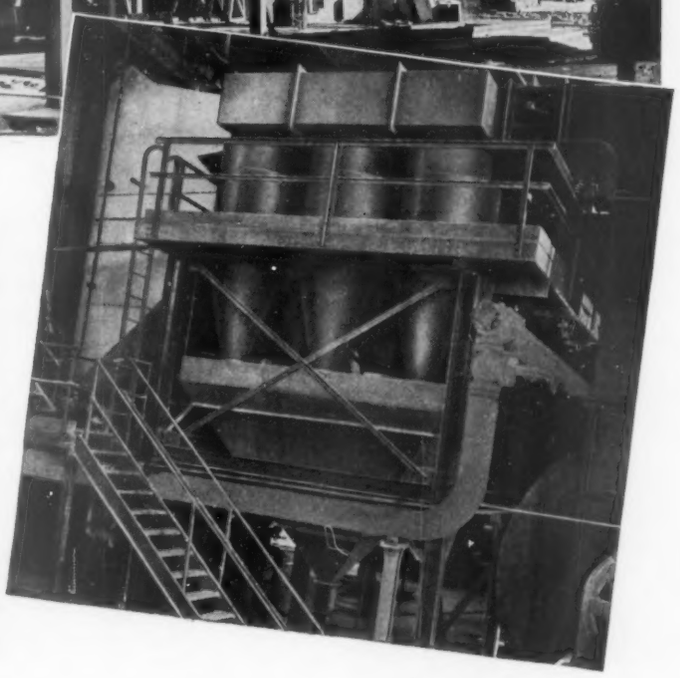
Obviously the time for planning new production equipment is *now*. To postpone the engineering study of important postwar cement plant equipment may result in costly plant shutdowns when tonnage is most needed. At this stage Buell can and will cooperate by assisting in engineering studies of additional plant equipment while time still remains plentiful.

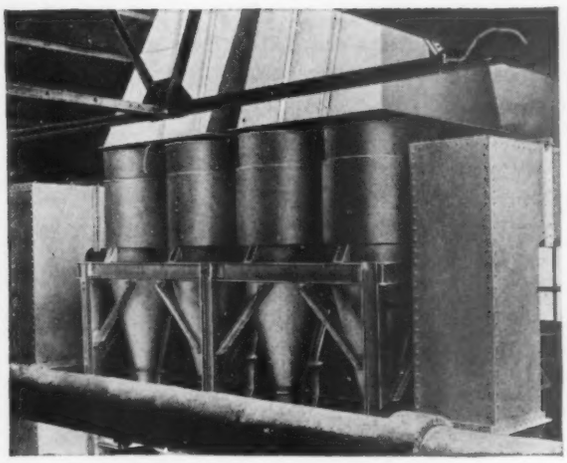
From all indications present priority requirements will continue after the war. Recognizing this fact and to make certain that they will have sufficient and proper equipment to assure increased postwar production, a number of cement plants have already obtained necessary priorities for Buell equipment now in process of fabrication.

Buell Engineers will be glad to discuss and study your plant equipment needs *now* while negotiations for priorities are under way.

Post-War Construction...







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Buell's new revised book—*"The Buell (van Tongeren) System of Industrial Dust Recovery"*—now in its fourth printing, is just off the press. Write for your copy today.

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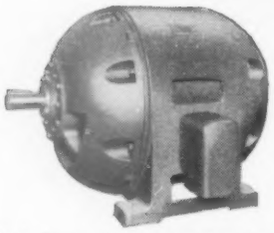
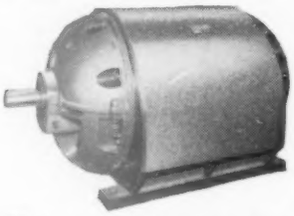
DESIGNED TO DO A JOB, NOT JUST TO MEET A "SPEC"

NOW your *big drives* can have it* too!

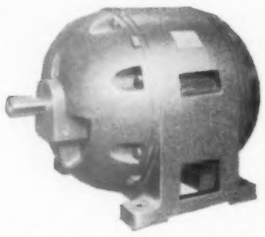
*The EXTRA protection of **TRI/CLAD** construction



Typical, large-size, sleeve-bearing Tri-Clad polyphase motor, now standard up to 2000 horsepower



Modified cast-iron frame construction used for certain large sizes of the extended Tri-Clad motor line



Separable housing construction used for large-size ball- or roller-bearing Tri-Clad motors. Roller bearings are standard at coupling end

G-E STANDARD Tri-Clad Induction Motors Now Available to 2000 Hp.

For that important *big* drive (up to 2000 hp, 3600 rpm) you can now get a G-E standard Tri-Clad induction motor with all the protective features that have proved so valuable in the more widely used sizes.

- **1. EXTRA PROTECTION FROM PHYSICAL DAMAGE**

  Cast-iron construction with upper portion completely enclosed to keep out falling objects, dripping liquids. Streamline, cast-iron end shields. Corrosion-resisting finish.

- **2. EXTRA PROTECTION FROM ELECTRICAL BREAKDOWN**

  Windings of Formex wire are solidly bonded with synthetic resins that are strongly resistant to oil and moisture. Formex wire insulation stands up remarkably under abrasion or "heat-shock."

- **3. EXTRA PROTECTION FROM OPERATING WEAR AND TEAR**

  Available with either sleeve or ball bearings—in dust-tight housings. Sleeve-bearing design is a further refinement of well-proved Tri-Clad motor bearing proportions, efficiently lubricated, with "air seal" to insure oil-tightness of the housing.

The Tri-Clad, in its wide range of types and sizes, is G.E.'s most widely used (integral-hp) motor. Chances are there's a Tri-Clad to meet your drive requirements "on the nose." Ask for Bulletin GEA-3580. *General Electric Company, Schenectady 5, N. Y.*

Here's Today's Wider Range of Standard Sizes	
TYPE K	1 hp to 2000 hp at 1800 rpm
TYPE KG (High starting torque, low starting current)	5 hp to 200 hp at 1800 rpm
TYPE KR (High starting torque, high slip)	Available to 100 hp in speeds required for high-slip, flywheel drive (punch presses, etc.)

NEW 2000-hp INDUCTION MOTOR LARGEST MEMBER OF TRI-CLAD FAMILY

Dwarfing the original Tri-Clad motor (resting on the conduit box) in size, this new 2000-hp "big brother" embodies all of the same protective construction features.

It operates at 1800 rpm, on 2300 volts, 60 cycles. This new 3-phase motor is in the 6360-frame series, which is five steps larger than the largest standard industry frame size (namely 505).

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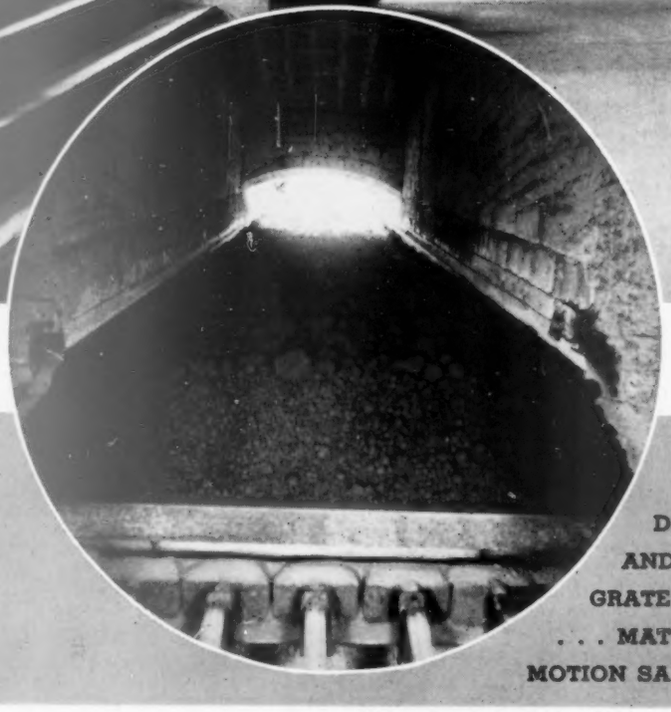


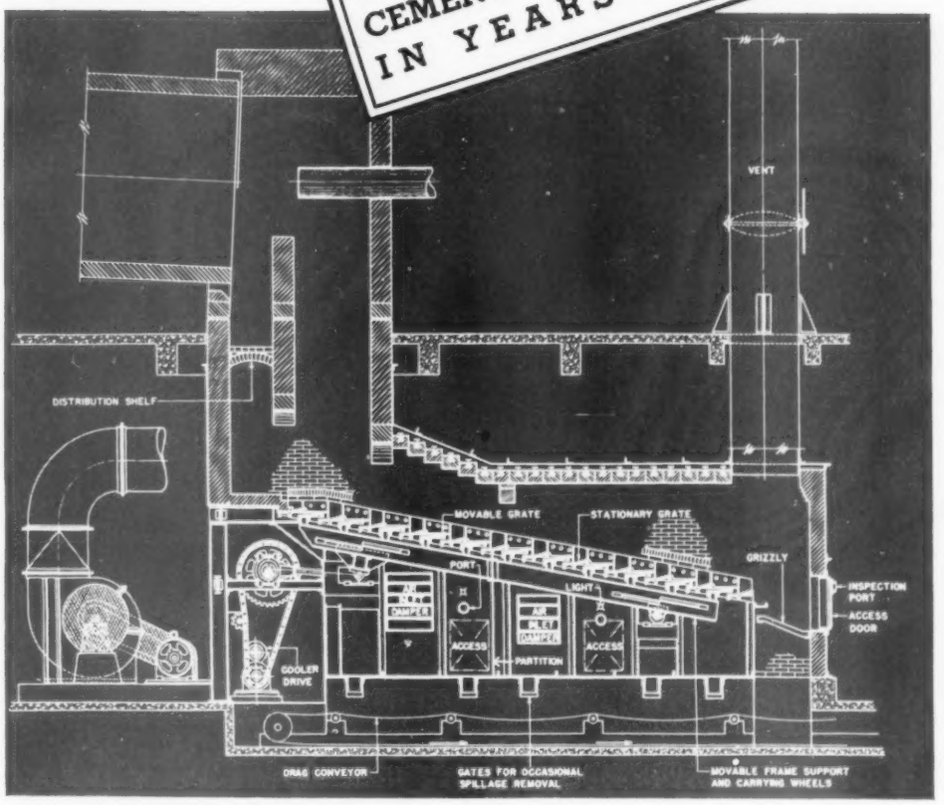
Upper left: Interior view of cooler, empty. Center: Six coolers installed in a cement plant. Left: Interior view of cooler, in actual operation, cooling clinker.

FULLER-KINYON, FULLER-FLUXO, THE AIRVEYOR CONVEYING SYSTEMS . . . ROTARY FEEDERS AND DISCHARGE GATES . . . ROTARY AIR COMPRESSORS AND VACUUM PUMPS . . . AIR-QUENCHING INCLINED-GRATE COOLERS . . . DRY PULVERIZED-MATERIAL COOLERS . . . MATERIAL-LEVEL INDICATORS . . . SLURRY VALVES . . . MOTION SAFETY SWITCH . . . AERATION UNIT . . . SAMPLERS

Air-Quenching Inclined-Grate Cooler

THE OUTSTANDING DEVELOPMENT IN CEMENT MANUFACTURE IN YEARS

1. Mechanical simplicity; requires comparatively little maintenance
2. Clinker moved as a flat inclined bed at uniform rate from chute to discharge end
3. Operation under direct observation at all times
4. Air chamber may be entered a few minutes after cooler is shut down
5. Drive mechanism simple; outside of cooler
6. Low power requirements
7. Heat Recovery. Users of the Fuller Cooler have reported savings as high as 20 per cent. These savings, due to recuperation, may be used to reduce fuel burned, maintaining normal capacity, or may be used to increase kiln output
8. Permits Use of High-Moisture Coal. Especially advantageous where unit pulverizers are used for direct firing of kilns
9. Air Quenching. Effective air quenching produces quality effects where desirable and necessary. Where autoclave expansion correction is necessary Fuller method of air quenching gives the desired results
10. Influence on Grindability. Supervised laboratory tests prove an increase in grindability. Reports from users also indicate increased grindability
11. Influence on Warehousing Properties. Our laboratory tests show improved warehousing qualities obtainable from clinker air-quenched by Fuller Coolers



IN THE RELATIVELY SHORT TIME THIS COOLER HAS BEEN ON THE MARKET. 123 HAVE BEEN SOLD. 41 OF WHICH ARE REPEAT ORDERS.

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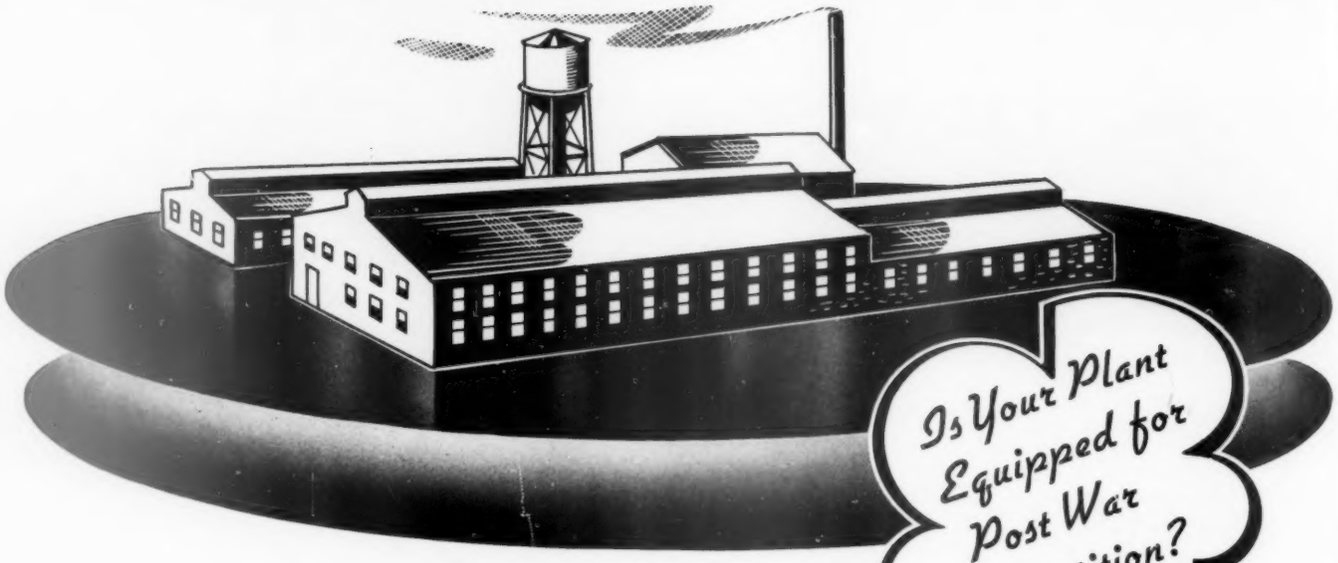

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- **SPEEDS UP PRODUCTION . . . . . .**
- **REDUCES MAINTENANCE COSTS . . .**
- **INCREASES EMPLOYEE EFFICIENCY . .**

Make your plans now because post war business will be on the "open market" with keen competition. Plant executives with an eye to the future will streamline their factories. If your plant is not already equipped for dirt and dust control, it should be number one on your "MUST" list. Dirt and dust slow up production . . . cause absenteeism and deteriorate equipment. The answer is Parsons Oval Bag Dust Arrestors, backed by 25 years of creative engineering. In most cases Parsons Dust Arrestors actually pay for themselves in greater production and employee efficiency. Let our engineers check into your dust problem. There's no obligation.

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Whether planning a new mill or considering converting your present cement plant to more efficient, more economical operating methods, Dorr Engineers will be glad to consult with you.

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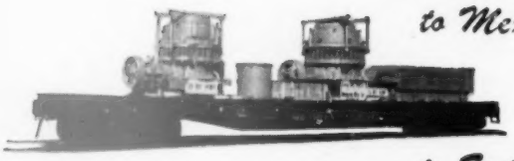
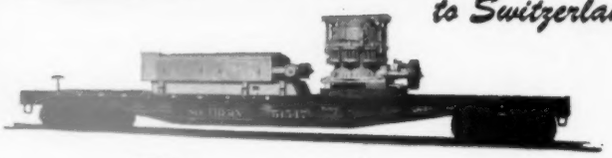


to Mexico



to Switzerland

to Brazil

to India

These four shipments are only a few of the recent repeat orders received from cement mills using Symons Cone Crushers.

Among the thousands of installations of Symons Cone Crushers, a large number are being used for fine crushing of raw material and clinker in the production of cement. In many countries throughout the world, Cone Crushers with their big capacity of finer and more uniformly sized mill feed are demonstrating that it is more economical to crush to 3/8" or even 1/8" than it is to coarse grind in a mill. A uniformly fine mill feed increases mill capacity for the same power imput, and reduces mill maintenance costs.

For all fine crushing operations, investigate the advantages of Symons Cones.

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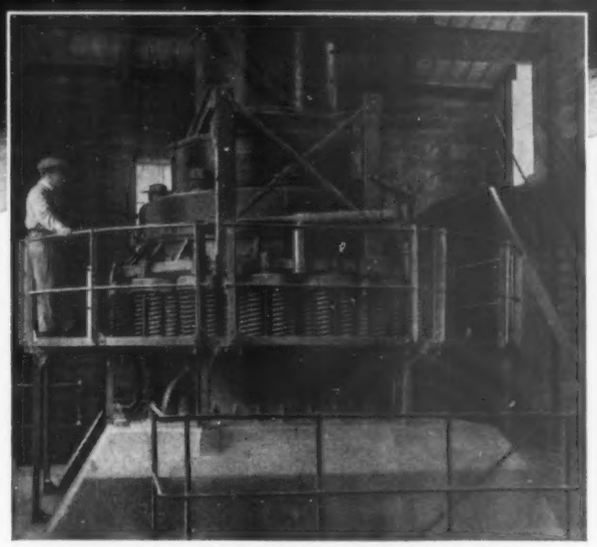
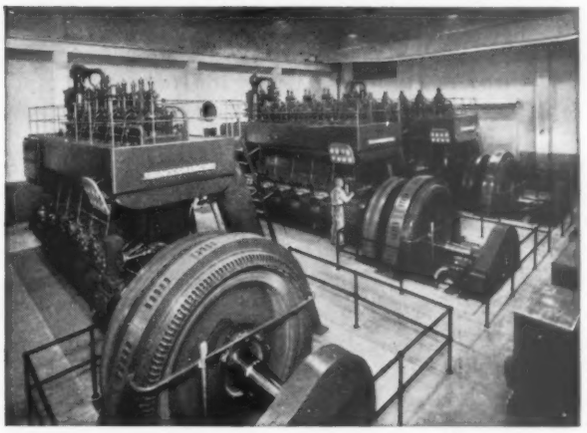
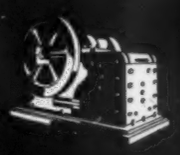
MODERNIZATION PROGRAM



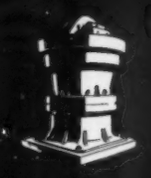
A 7 foot Cone Crusher installed in a cement mill in England.

This 6000 horsepower installation of three Nordberg Diesels supplies low cost, dependable power for cement production.



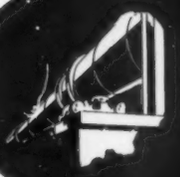


JAW CRUSHERS

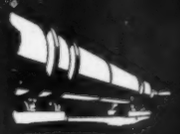


GYRATORY CRUSHERS

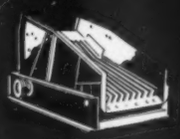
GRINDING MILLS



ROTARY KILNS



COOLERS



GRIZZLIES

NORDBERG MFG. CO.
MILWAUKEE 7, WISCONSIN
NEW YORK • LOS ANGELES • LONDON • TORONTO

NORDBERG MACHINERY

The cement industry and other industries engaged in the processing of ores and minerals will find their equipment requirements amply provided in the full line of machinery offered by Nordberg and its subsidiary, the NORDBERG PROCESS MACHINERY COMPANY. Qualified engineering services covering machinery and plant design are also available. If you are considering a new plant or a change in existing equipment, investigate what Nordberg has to offer.

the

FUEL CONSUMPTION RECORD ON BUCYRUS-ERIE SHOVEL

FORMER ENGINE *20 gallons of gasoline a day*

SHEPPARD DIESEL *5 gallons of fuel oil* a day*

*(at half the cost per gallon of gasoline)

IN FEBRUARY, 1945, the Jones Scott Company of Walla Walla, Washington, selected a new engine for their Bucyrus-Erie Shovel. Because they wanted to lower fuel costs, they specified a Sheppard Diesel.

Records prove that Jones Scott couldn't have made a better choice. The Sheppard Diesel uses about five gallons of oil per day. The former engine consumed about twenty gallons of gasoline. Diesel fuel costs only half as much as gasoline. Enormous is not an exaggerated term to use for the savings in fuel costs when it is considered that this Sheppard Diesel operates eight hours per day, six days per week.

The engine must be able to handle shock loads and quick load changes in addition to delivery of peak power for long periods of time. In the words of Jones Scott, they chose a Sheppard Diesel because of "economy, availability and cheapness of fuel, high power output with minimum weight and ease of servicing in the field."

When you buy a power unit, remember that you have to add fuel costs to the purchase price. Find out how little Sheppard Diesel operation costs. Write today for free literature and, if you wish, we'll also advise you about obtaining WPB approval.

POWER UNITS; 8 TO 56 HP • GENERATING SETS· 3 TO 36 KW

Sheppard

ALL AMERICAN DIESEL POWER UNITS

R. H. SHEPPARD COMPANY
2113 Middle St., Hanover, Pa.

Please send me free literature describing Sheppard Diesel Power Units.

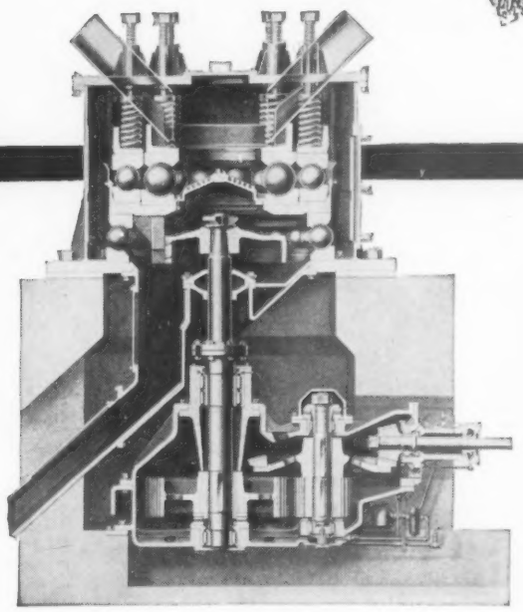
Name .....

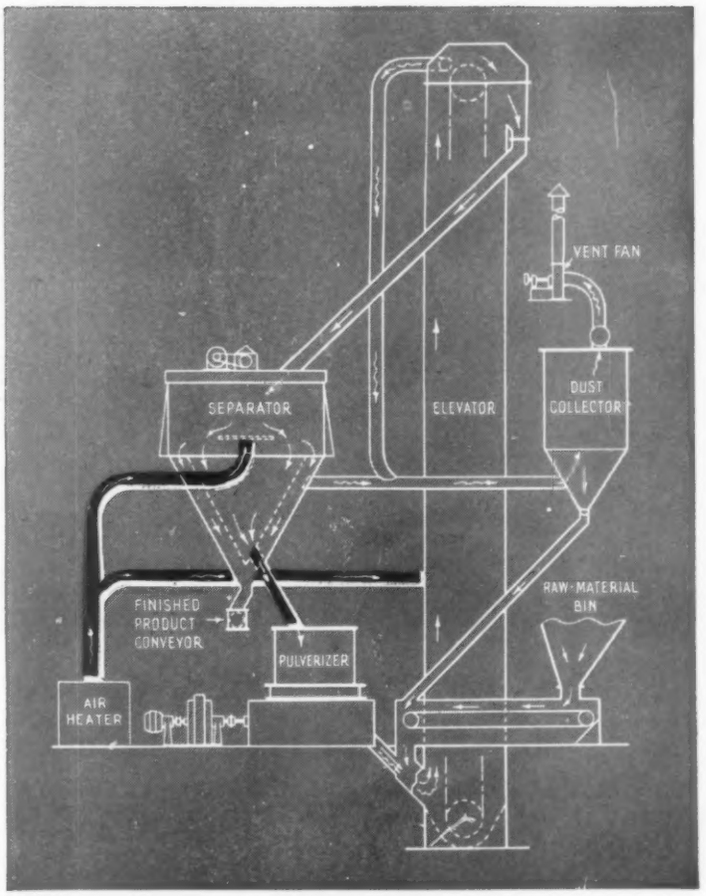
Firm Name .....

Address .....

.....

DRYING AND GRINDING in ONE operation...with the B&W Closed-Circuit System





- Eliminates separate drying equipment
- Reduces cost of kiln feed
- Substantial circulating load assures a well-blended product

THE BALL-BEARING PRINCIPLE OF GRINDING MAKES THESE ADVANTAGES POSSIBLE

THE BABCOCK & WILCOX CO.

85 LIBERTY STREET, NEW YORK 6, N. Y.

C-58

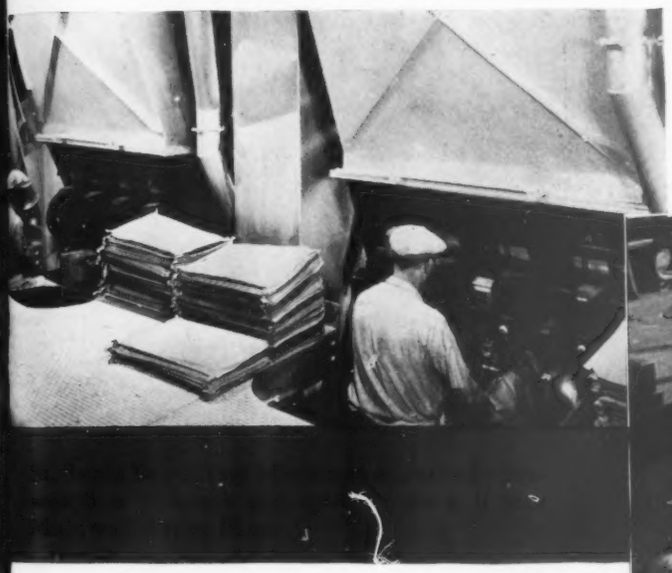
Cement Goes to War...
packed in MULTIWALL PAPER BAGS

ON many South Pacific Islands, cement today is on the job — helping to consolidate our far-flung battle lines. » » » To assure the safe arrival of this vital war material, the Government has specified that it be shipped in Multiwall Paper Bags. These tough, moisture-resistant bags prevent cement caking in transit, in storage . . . or on an island beach-head. » » » In addition, Multiwalls are quickly machine-filled in producers' plants. They are quickly and easily handled . . . anywhere.

ON HOME FRONTS as well as battle fronts, Multiwall Paper Bags are "delivering the goods."

Cement packed and delivered in Multiwalls has speeded the completion of airfields, factories, hospitals, bridges and many other important military and industrial projects.

In post-war construction Multiwalls will also play an important part by delivering cement and kindred rock products.



MULTIPLY PROTECTION • MULTIPLY SALEABILITY

St. Regis MULTIWALL

PAPER BAGS

ST. REGIS PAPER COMPANY
TAGGART CORPORATION

NEW YORK 17: 230 Park Ave. CHICAGO 1: 230 No. Michigan Ave.
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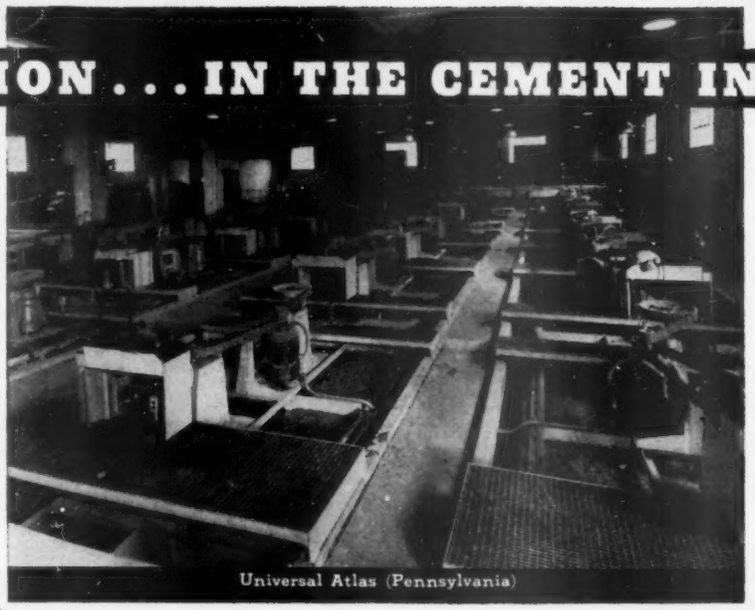
New Orleans, La. Birmingham, Ala. Seattle, Wash. Nazareth, Pa. No. Kansas City, Mo.

IN CANADA:
St. Regis Paper Co. (Can.) Ltd.
Montreal, Quebec
Vancouver, British Columbia

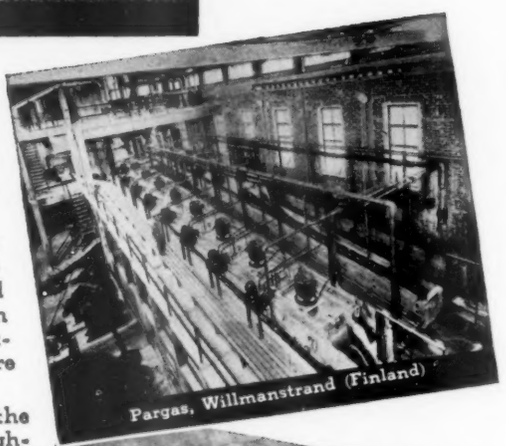
Valley Forge (Pennsylvania)

Permanente (California)

FLOTATION . . . IN THE CEMENT INDUSTRY


Universal Atlas (Pennsylvania)

Alpha Cem. Co., Ltd. (South Africa)


Pargas, Willmanstrand (Finland)

Seventy percent of all the new cement plant capacity built (in U.S.A.) since 1932 installed flotation.

The process extends the life of raw material deposits. Cement of the highest quality and uniformity can be produced from inferior raw materials, permitting the use of deposits heretofore considered unsuitable.

Benefits through the use of the Breerwood Process range throughout most of the operating departments of a cement plant. In some instances the saving in quarry operation alone more than offsets the cost of flotation.

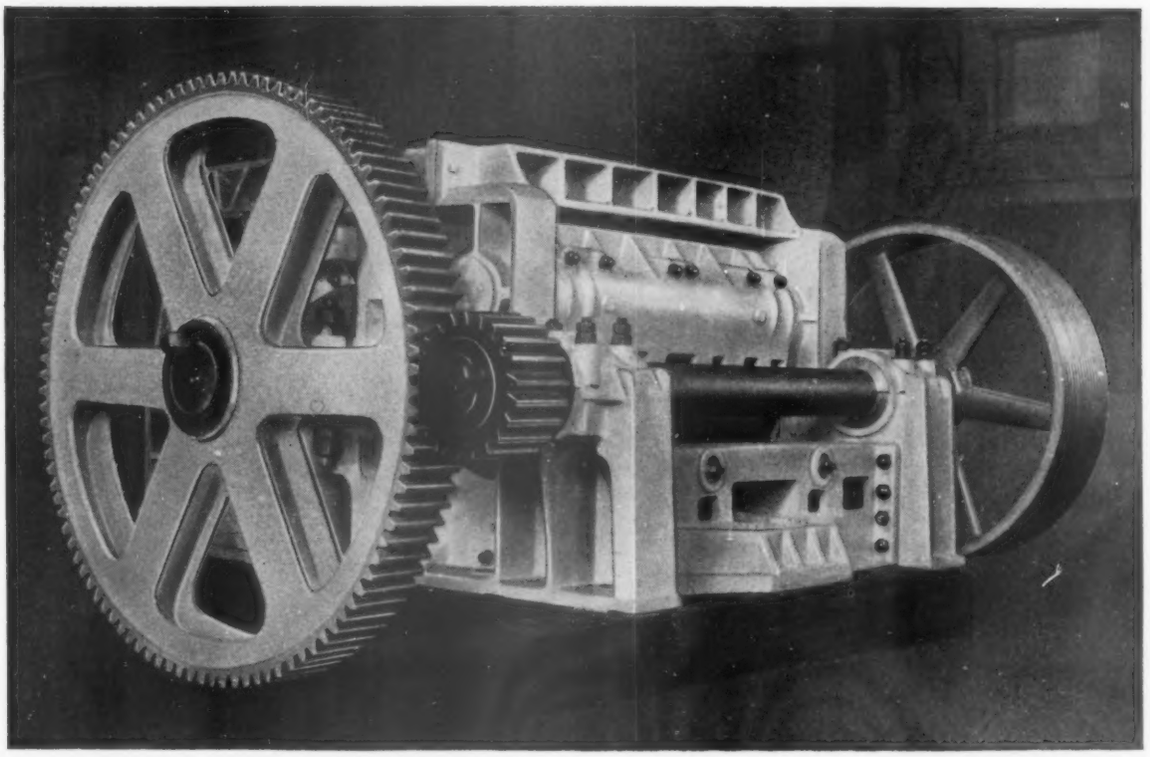
We design and equip complete plants for handling cement raw materials. Our laboratory is fully equipped for test work on an experimental or commercial scale. Write us for particulars.

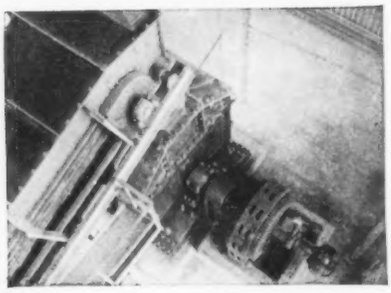
National (Pennsylvania)

Argentine Port. Cem. Co. (South America)

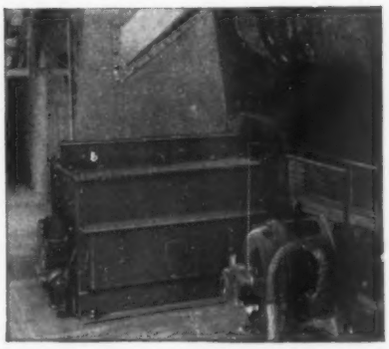
SEPARATION PROCESS COMPANY
CATASAUQUA, PENNSYLVANIA

"PENNSYLVANIA"





"Pennsylvania" **STEELBUILT** ***REVERSIBLE*** Hammermill, SUPER-CEMENT Series, size C-16-58, preparing 42" Gyratory's output of hard Hudson River Limestone, for grinding.



"Pennsylvania" **STEELBUILT** ***REVERSIBLE*** Hammermill, which makes fine Limestone sizes for Farm and Process Industries.

"PENNSYLVANIA" *STEELBUILT*

PENN-LEHIGH Single Roll Crusher, assembled before shipment for primary service in one of South America's modern Cement Plants.

An early PENN-LEHIGH, during the past 16 years, has crushed over 17,000,000 tons of Steam Shovel size hard Limestone and Cement Rock, without repairs, other than V-Belts and occasional welding for restoring Roll Teeth contours.

PENN-LEHIGHS in six (6) sizes, with capacity range from 300 to 1,200 tons hourly, assure dependable, low-cost, uninterrupted production, in Cement, Lime and Gypsum Plants.

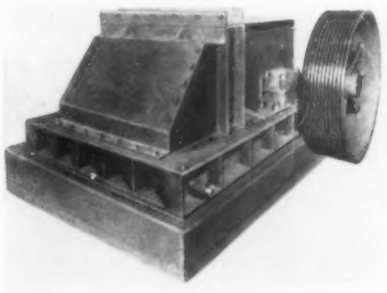
PENNSYLVANIA CRUSHER COMPANY

Our Engineers are at your service

LIBERTY TRUST BLDG., PHILA. 7, PA.

Associated with Fraser & Chalmers Engineering Works, London

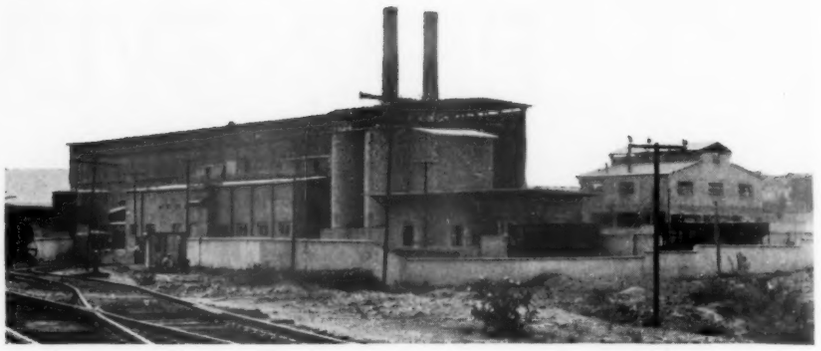
Another "Pennsylvania" ***REVERSIBLE*** putting through 600 tons hourly for grinding, —with Automatic Hammer Turning, and Minimum Upkeep.



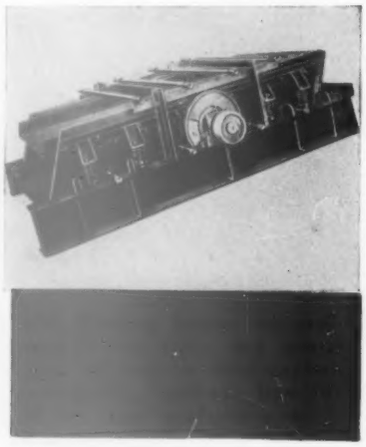
"Pennsylvania" Single Roll Coal Crusher, Toggle Release for tramp iron,—quick change, 1" to 8" sizing,—50 to 1,000 tons hourly.

STEELBUILT CRUSHERS

100%



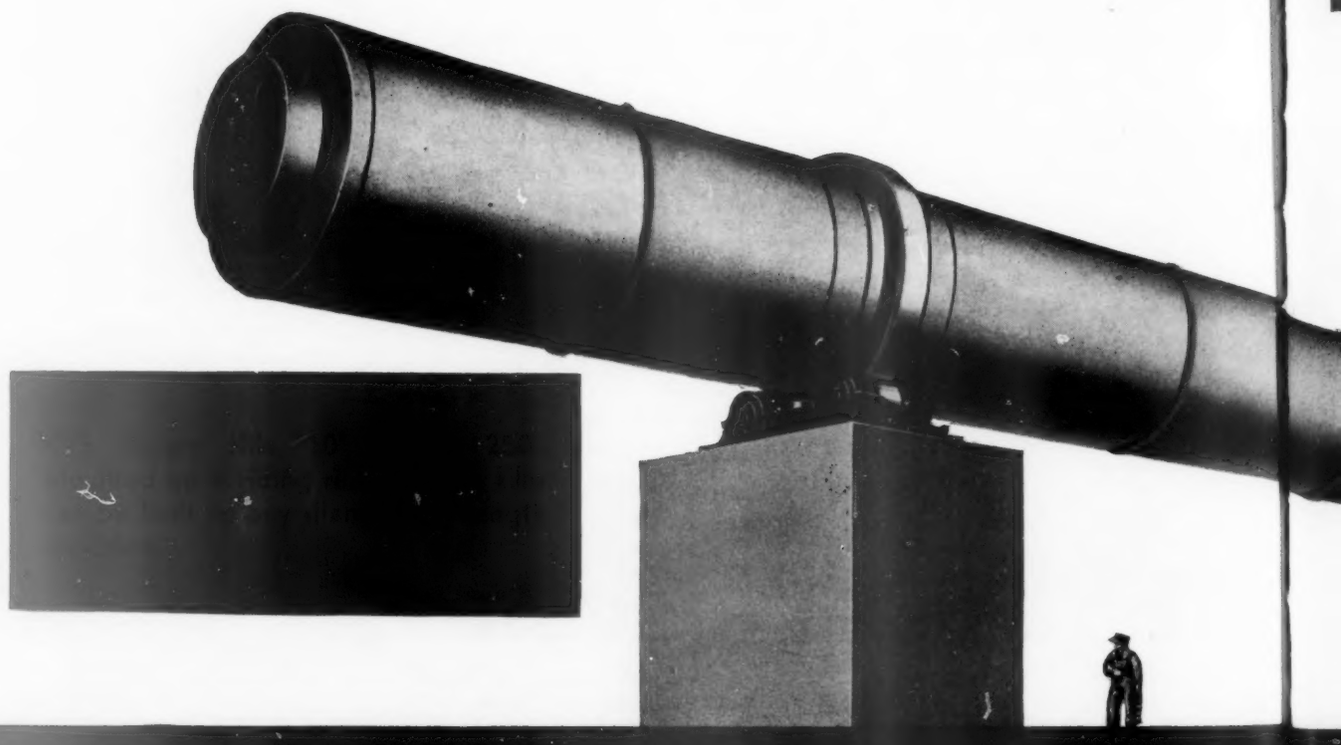
EQUIPPED . . . the Modern Cement Plant . . .



"It's probably a KENNEDY job" . . . that's usually the case in modern-equipped plants where operators carefully plan the layout to insure utmost production economy in making cement.

KENNEDY machines for every phase of cement manufacture are in wide and successful use throughout the world. They have a time-proved reputation for profitable performance under all types of working conditions.

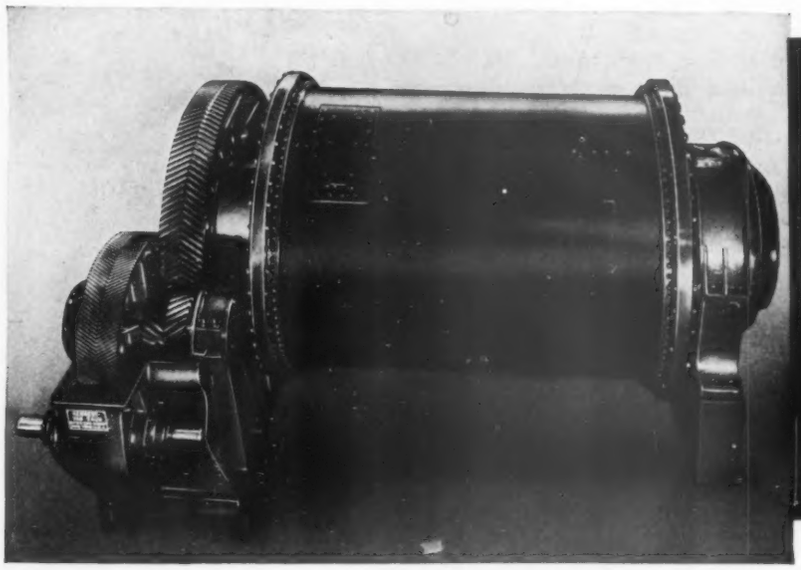
KENNEDY Products also include a complete line of crushing, screening, pulverizing, sand washing, burning and mining equipment.



KENNEDY-VAN SAUN MFG. & ENG. CORPORATION

100% KVS

SERVICE by KENNEDY-VAN SAUN

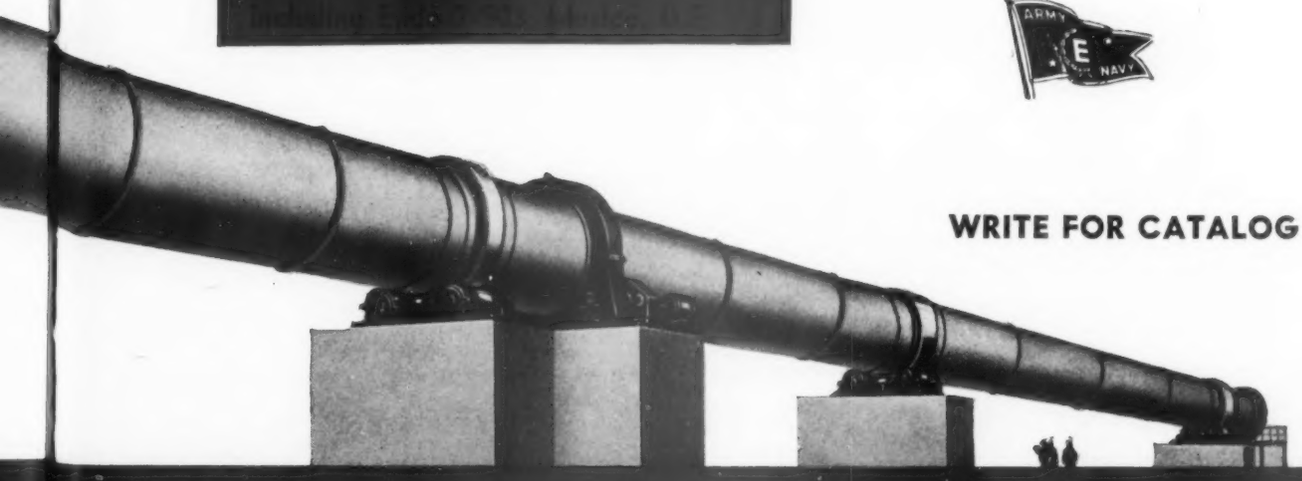


KVS Integral Gear Driven Tube Mill for use on Combination Ball Mills, Wet Grinding Tube Mills, Dry Grinding Tube Mills and Air Swept Tube Mills. Gears can not be misaligned, because the gear housing supports the discharge end of the mill and the pillow block bearings carrying the gears. All bearing seats are machined in a jig at the factory to a tolerance of .001" or .002" total indicator reading.

Replacement parts for all our equipment in the United States and Foreign countries including Egypt, Africa, Mexico, U.S.S.R.

ARMY E NAVY

WRITE FOR CATALOG



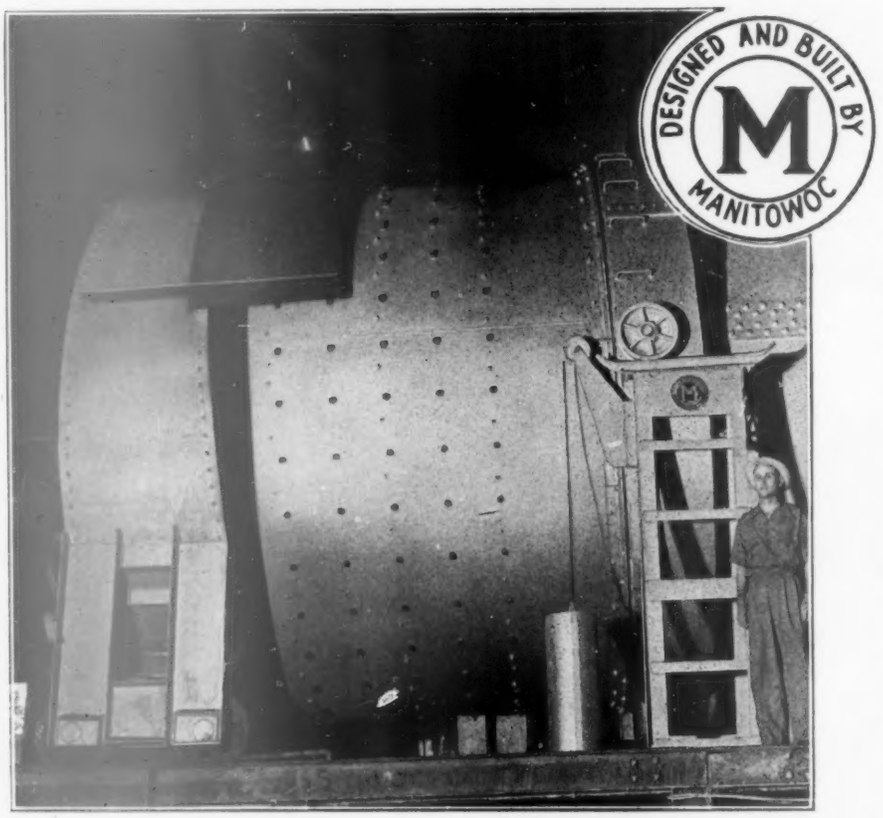
2 PARK AVENUE • NEW YORK 16, N. Y. FACTORY: DANVILLE, PA.

THREE OUTSTANDING DEVELOPMENTS:

The Vanderwerp Recuperator for Rotary Kilns
Insures immediate air quenching and maximum heat recovery.

The Minogue Slurry Agitator
Provides thorough agitation and blending with minimum power and air consumption.

The Minogue Kiln Feeder
The only practical device for introducing flue dust in the dry state.



Vanderwerp Type S Recuperator applied to Unit-Fired Rotary Cement Kiln 11 ft. x 400 ft. (Repeat Order)

The wide acceptance of the Vanderwerp Recuperator in the United States has led to important installations in South America, Australia and the Phillipines.

The demand for units of high capacity has resulted in our Type S design suited to kilns of maximum output. In all cases the Recuperators may be readily attached to an existing kiln, requiring the minimum of labor in erection, involving no foundations or brickwork and occupying minimum floor space.

MANITOWOC ENGINEERING WORKS

Division of

GENERAL OFFICES AND PLANT
Manitowoc, Wisconsin

Manitowoc Ship Building Company

CHICAGO OFFICE
131 E. Wacker Drive

IT'S THE

THAT GIVES BETTER AIR SEPARATION AT

!

Hundreds used by the cement industry—sold on approval—

THE STURTEVANT WHIRLWIND

adjusts to all materials and operating conditions

When you consider the various combinations of materials, their peculiarities, the different circulating loads, and types of pulverizers—you can readily see why you need properly counterbalanced regulation and control of the two basic forces to give satisfactory air separation. This the Sturtevant "Whirlwind" gives you—through simple and reliable ADJUSTMENTS. Net result: a continuously uniform product of any desired fineness, selected and collected and delivered at low cost. Is it any wonder that hundreds of Sturtevants are used by the Cement Industry? In cement processing, accurate air separation is an all-important factor—and no Sturtevant has ever failed to live up to the requirements of this industry 100%.

WRITE US—Let us tell you more about this Sturtevant Separator. It is the result of over 20 years experience with Separators and 58 years experience with Pulverizers. Ask for Bulletin 087 giving details, specifications, diagrams.

• *Send for bulletin 087*

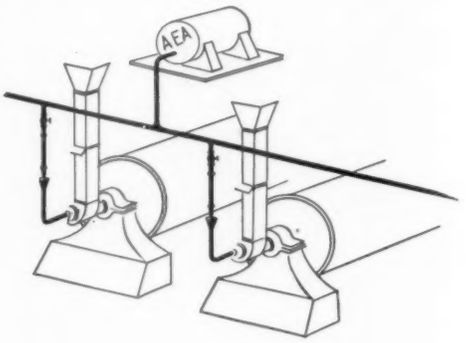
STURTEVANT MILL CO.
HARRISON SQUARE
BOSTON 22 MASS.

SIMPLIFY THE MANUFACTURE OF AIR-

Darex AEA is a new air-entraining agent that has been thoroughly tested both in the laboratory and in the field. Darex AEA is permitted by A. S. T. M. for treated cement specification C 175-44T.

Darex AEA is a development of over five years' research in our laboratories, backed by our fifteen years of field work with cement manufacturers in the use of TDA. Already over twenty mill runs have been made with Darex AEA and over a million barrels of air-entraining cement have been made.

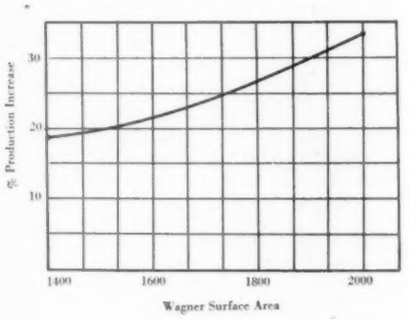
COMES READY TO USE AS RECEIVED



Darex AEA is a water-soluble compound that comes in convenient drums or tank-cars, ready to use as received. It is easy to use and absolutely safe—no mixing—no harsh chemicals—no extra safety precautions necessary.

DAREX AEA IS A POWERFUL GRINDING AID

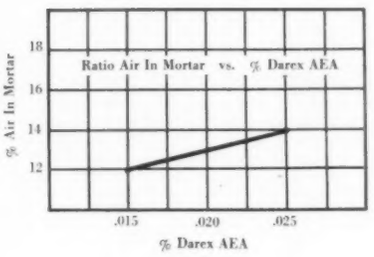
Based on our experience with TDA, the new Darex AEA is a powerful grinding aid which increases production and maintains a relatively uniform surface area in the cement being ground. This gives uniform mill control.



A companion product to **TDA**

A PRODUCT OF

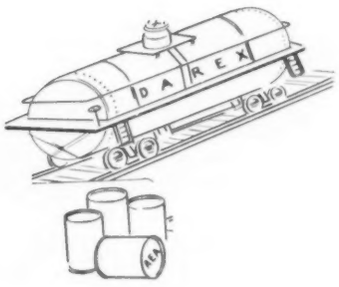
ENTRAINING CEMENTS WITH DAREX AEA



IT IS NOT SUPER-SENSITIVE

Darex AEA is not super-sensitve, as small variations in the amount used are not critical and do not greatly affect the air entrained.

Mill superintendents know that fluctuations in the feed of the clinker require an air-entraining agent added in a constant flow to have sufficient latitude so that it will not produce cements incorporating varying amounts of air. Repeated mill runs have shown that even under adverse conditions Darex AEA is not super-sensitive and gives controlled air in cement mortars.



READILY AVAILABLE

Shipped in convenient containers from 55-gallon drums to tank-cars, F.O.B. Chicago, Illinois. Ready to use as received.

DAREX AEA IS ECONOMICAL

Mill operators find Darex AEA inexpensive to use. Under average operating conditions, the increased mill production more than offsets any out-of-pocket cost of Darex AEA. In addition, due to the catalyst in Darex AEA, it is not necessary to grind to a greater fineness to obtain strengths comparable to those of untreated cements.

* * *

From our experience to date, Darex AEA when added to the finish mill grind gives cements that incorporate uniform amounts of air. It is easy and safe to use. It has been declared acceptable by A.S.T.M. for cement specification C 175-44T. We don't claim that it is a cure-all, but believe it is worth your investigation. Why not make a mill grind and see for yourself what Darex AEA can do with your cement?

ARMY (E) NAVY

DEWEY AND ALMY CHEMICAL COMPANY CAMBRIDGE 40 MASSACHUSETTS

Here's the *MULTICLONE* Story in a Nutshell . . .

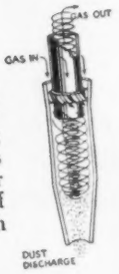
IT SAVES SPACE

and we mean really important space savings. The chart here tells only part of the story because, in addition to being far more compact both in square and cubic footage, the *shape* of the MULTICLONE can be adjusted to fit various space requirements—long and narrow, short and wide, or square. You can often fit the MULTICLONE into tight spaces or waste areas too small for other equipment!

Make	Relative Space Requirements In Sq. Ft.	In Cu. Ft.
Multiclone	1.0	1.0
Collector A	2.1	1.8
Collector B	5.9	3.2
Collector C	6.8	3.9

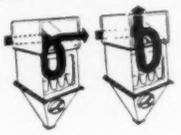
IT RECOVERS THE "FINES"

as well as the coarser particles. Its patented *vane* design and small diameter tubes generate higher centrifugal forces, thus recovering a large percentage of the very fine particles 10 microns and less in addition to the heavier particles. MULTICLONE's high recovery of *both* small and large particles means high overall efficiency on *any* application!



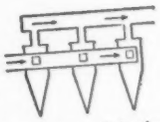
IT IS UNUSUALLY ADAPTABLE

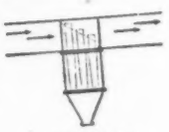
for, in addition to the *shape* adaptability outlined above, inlet-outlet connections are also easily adaptable. For low headroom, install the MULTICLONE with side-inlet, side-outlet. Or for tight side clearances, use side-inlet, top-outlet connections. Still other arrangements are possible for special conditions!

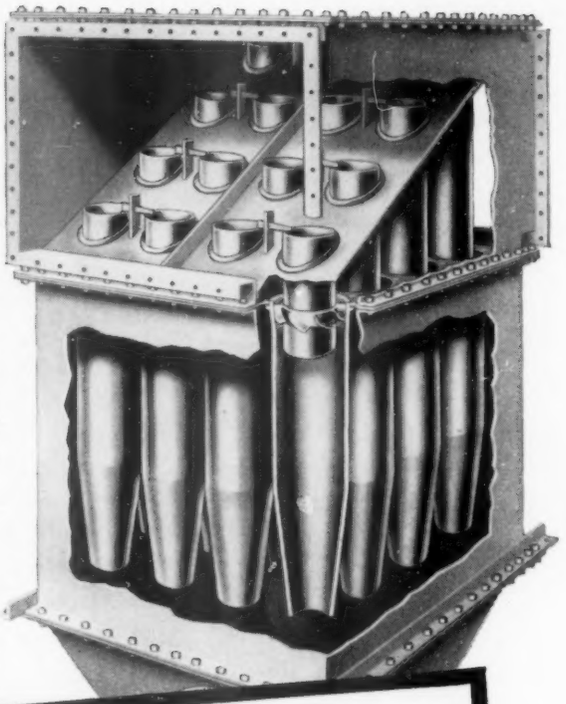


IT IS SIMPLE

both to install and to maintain. For example, the MULTICLONE requires only single inlet and outlet ducts compared with the complicated *multiple* ducts of conventional cyclones. Not only saves space—but is simpler and cheaper to install and insulate. Moreover, the MULTICLONE has no filters to clog, no high-speed moving parts to maintain . . . and a single collecting hopper serves an entire bank of tubes!


Conventional Cyclone


Multiclone



On any dust recovery job —large or small— the MULTICLONE has many advantages!

WHY LIMIT your dust recovery job to one or two performance features when the Multiclone combines so many important advantages in the one unit? Check over some of the Multiclone's multiple savings outlined at the left. Note how—on every important feature the Multiclone is the answer. These and other Multiclone advantages are the result of experience gained through more than 38 years of specialization in the science of dust recovery, beginning with the first commercial application of the well-known Cottrell Electrical Precipitator. Take advantage of these years of specialized study by installing Multiclone.

WESTERN Precipitation CORPORATION

ENGINEERS, DESIGNERS & MANUFACTURERS OF EQUIPMENT FOR COLLECTION OF SUSPENDED MATERIALS FROM GASES & LIQUIDS

Main Office: 1015 WEST NINTH ST., LOS ANGELES 15, CALIFORNIA
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GET ALL THE FACTS. Send for this booklet that describes the many MULTICLONE advantages. Also let our trained engineering staff study your particular problem and show how MULTICLONE's multiple savings will benefit you. No obligation, of course.

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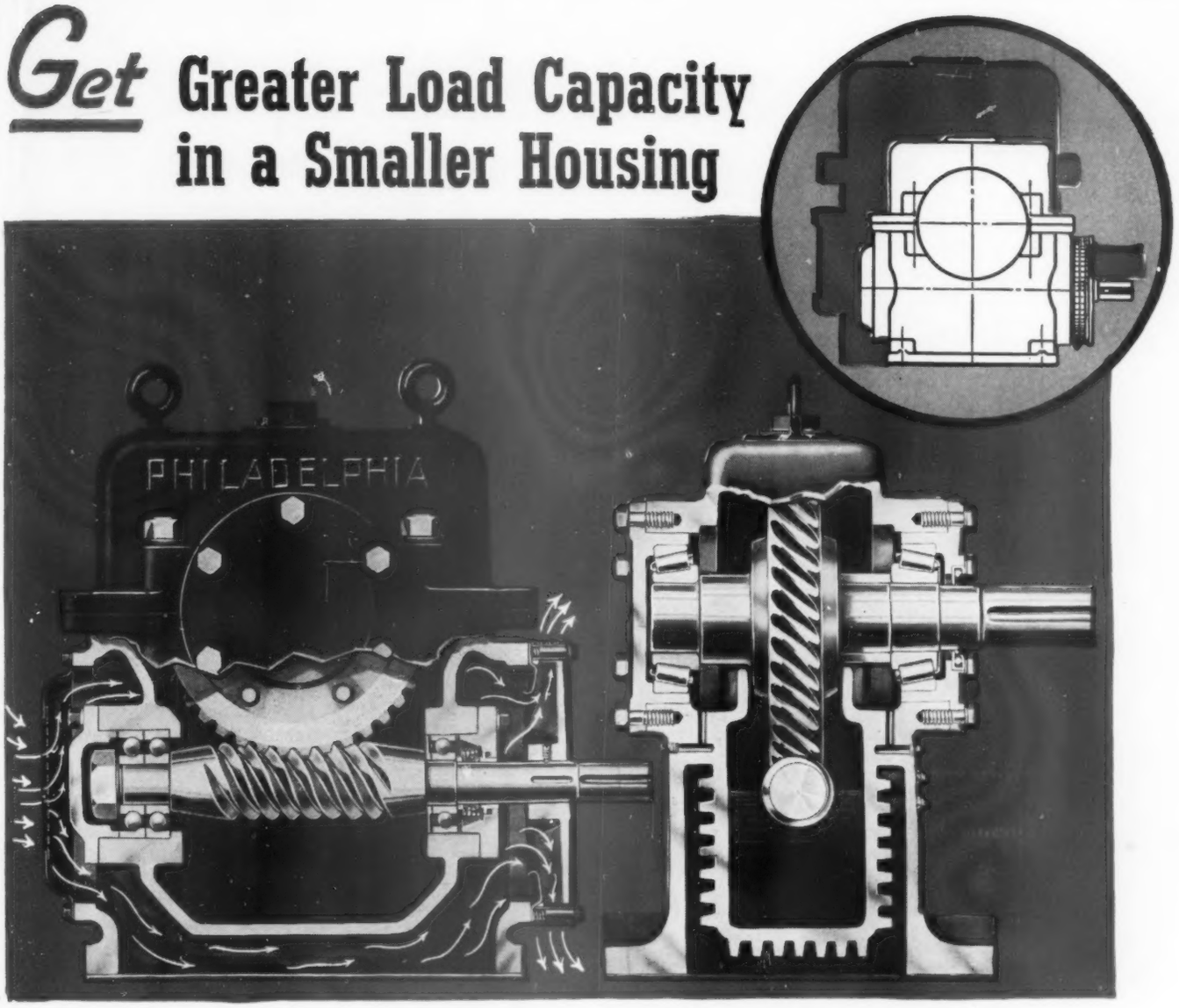

...with the Philadelphia AIR KOOLED Worm Gear Speed Reducer

At the upper right is shown the comparative sizes of a size 675 Type AT standard unit (in blue) and a size 475 AirKooled unit. Both deliver 20 HP at 1750 RPM. Ratio 4 6/7 to 1.

The cut-away drawings show the double-walled, finned housing and the flow of air around the oil reservoir.

Considerable *space* and *weight* savings have been made possible by the design of Philadelphia AirKooled Worm Gear Reducers as compared with standard heavy duty type worm gear units.

The AirKooled design features a suction fan, mounted on the worm shaft, which draws air through the double-walled, finned housing. This dissipates generated heat, and thereby maintains a higher contact oil film strength and greatly increases the horsepower ratings at worm speeds of 580 and 1750 RPM. For all ratios at 1750 RPM the ratings are approximately doubled, so the AirKooled unit is about two sizes smaller than a standard unit of the same capacity.

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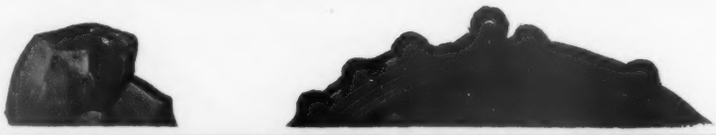

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Feed opening of the "Mammoth" crusher which crushes 48" rock to 1" in one operation.

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The "Mammoth" crushes 48" rock to 3", 2" or 1" in one operation. Takes the place of a primary breaker and recrusher.

The "Jumbo" reduces 20" to 30" rock to 1¼" and smaller.

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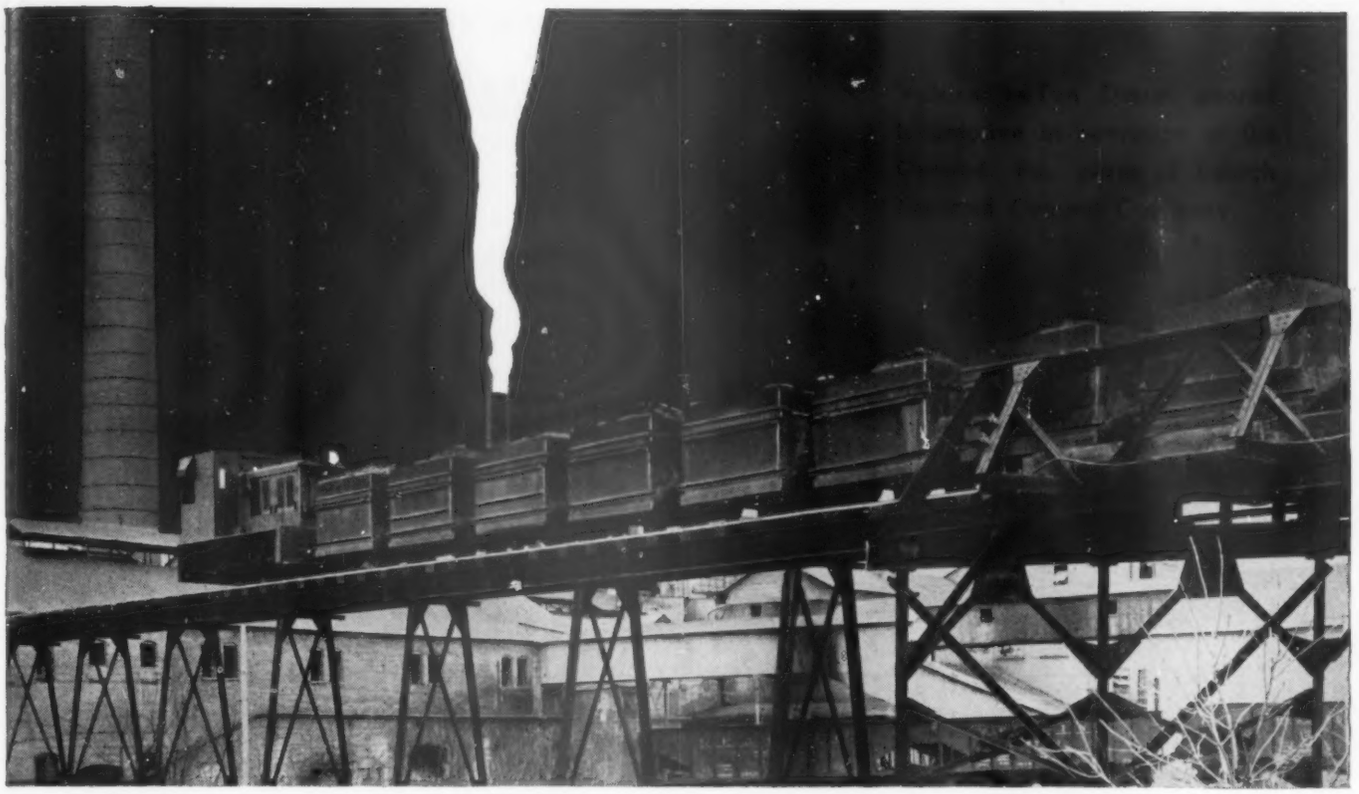

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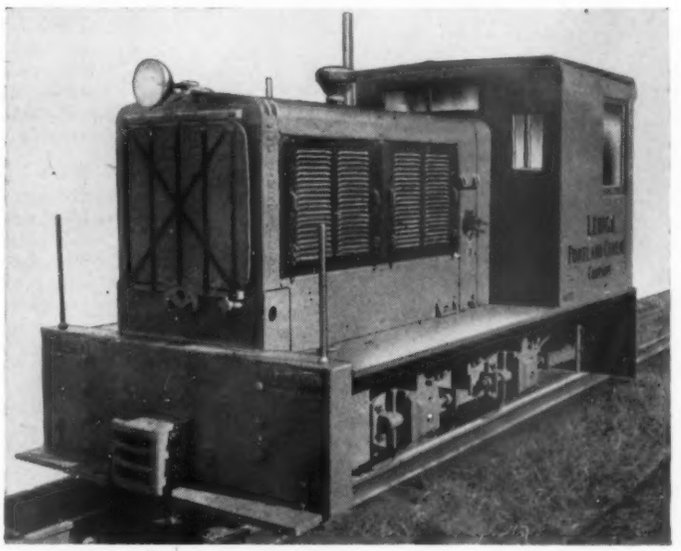
and still "As Good as NEW"

Since July 1937 this sturdy Vulcan locomotive has been hauling ten-car trains of heavy rock from crushing plant to grinding mill—averaging 250 cars per 8-hour day over a three-quarter-mile round trip; with a maximum grade against the load of approximately one percent. And for all practical purposes, it's still as good as new.

Much of the credit for this money-saving record must go to the competent executives who have been responsible for its operation and maintenance, but back of it all are the ample margins of strength and power for which Vulcan locomotives have always been noted and which have made them the choice of many other great industrial organizations for over half a century.

More and better Vulcan locomotives are being built today than ever before—steam, gasoline, Diesel and Diesel-Electric—from 6 to 100 tons in weight—wide or narrow gauge. Deliveries are still subject to approval of the War Production Board but inquiries are cordially invited and will be given the fullest possible benefit of whatever priority can be secured.



Close-up of 14-Ton Vulcan locomotive shown in operation above. Equipped with 6-cylinder Caterpillar Diesel engine rated 145 hp. at 1000 r.p.m. and Constant-Mesh Four-Speed Spur-Gear Transmission which not only facilitates speed-changing but also eliminates all possibility of gear-stripping.

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THE double whizzer with slide damper control makes it easy to obtain any grade of cement from a standard Portland to a high early strength specification with no other adjustment than in the slide dampers from outside the machine.

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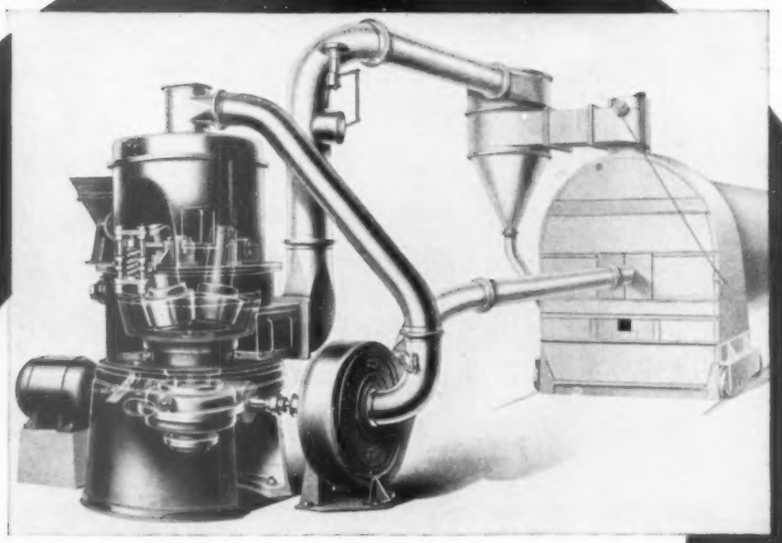

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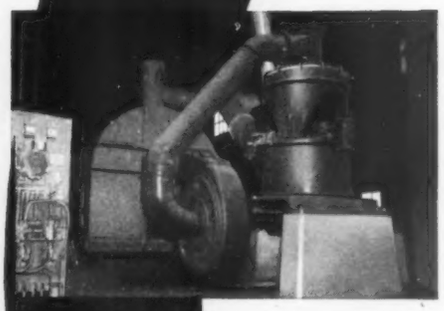
Nothing can equal the running record of Bowl Mills, operating continuously, 24 hours per day, month after month, without shutdowns. Dustless, noiseless, vibrationless . . . with panel board control . . . a perfect set-up for years of profitable production through maximum economy in kiln-firing.



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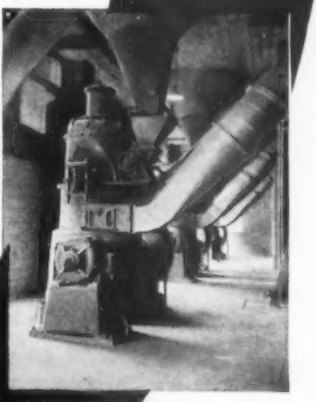

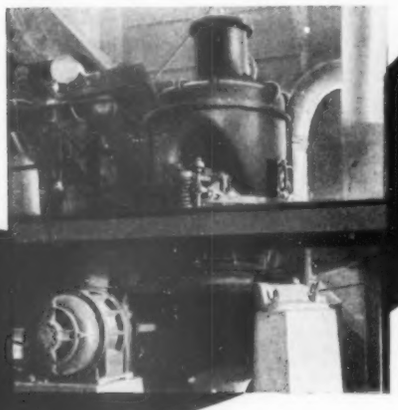

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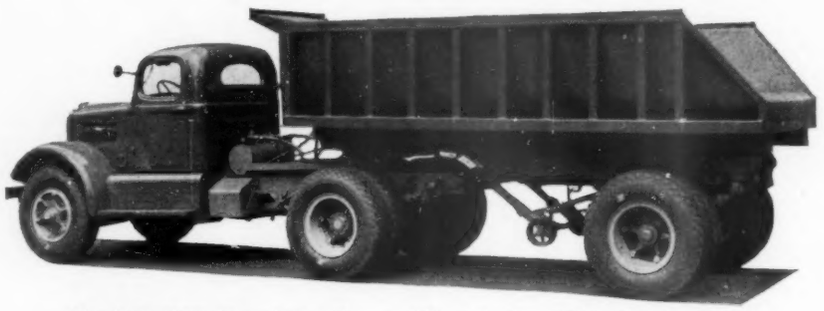

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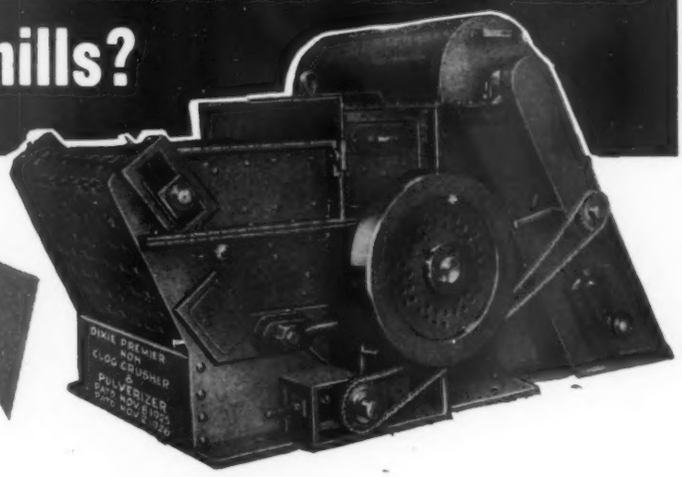

ONLY DIXIE

Non-Clog Hammermills have this feature

Moving Breaker Plate

...that's why **Tough Rocks and Sticky Material** never stop Production when you use a **DIXIE**

High crushing costs are usually caused by "traffic jams"—feed failures when the crusher throat is choked with clayey, sticky material.

These production break-downs are eliminated in the DIXIE Non-Clog Hammermill by the unique moving breaker plate, which insures positive mechanical feed at all times, with record capacities.

Furthermore, the DIXIE moving breaker plate can be moved backward or forward from the hammer points, giving full control of quality and size of product.

For example: the Cuban Portland Cement Company reported a serious output problem in their quarry operations.

This was due to the inability of their old crushing equipment to handle wet raw material, resulting in delays and continuous chokeups.

Then they installed a No. 7260 DIXIE Non-Clog Hammermill, fitted with a movable breaker plate.

Since then, the DIXIE has worked *continuously* under all conditions, even crushing plastic, water-soaked mud for days at a time.

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SINCE 1905

Legal Decisions (*from page 96*)

is the factor which causes the disease."

In all suits filed by employees to recover damages from employers for contracting silicosis an important question is whether the employee contracted the disease while working for the employer against whom the suit was filed, also, whether the employer's negligence resulted in the employee contracting the disease. For example, in *Wommack v. Orr*, 176 S. W. (2d) 477, the court records show that an employee sued his employer to recover $25,000 damages. The employee alleged that he had contracted silicosis as a result of the negligence of his employer.

During the trial the employee testified, as follows: "The dust accumulated on my arms and on my face, on my clothes. . . . It got in my nose and my eyes and my ears. I could certainly feel the effects of breathing the dust; it would just be dust in your nose or your mouth; you could see this dust in the air through the sunshine; you could see it otherwise than in the sun any time if you wanted to look for it. I have seen dust in closed float bins until I would have to go to the window and stick my head out and get a good breath."

However, the employee failed to prove that his employer had disobeyed safety laws and, also, failed to prove that other employers in the same business used greater care to protect employes against contraction of disease. Moreover, the employee failed to prove that other employees, who worked with him, had contracted silicosis. Therefore, the higher court refused to hold the employer liable in damages, and said:

"No one is held by the law to a higher degree of care than the average in the trade or business in which he is engaged. . . . A man, in conducting his business in the way that everybody else in a like business does, has measured up to the standards demanded by the law and has exercised the ordinary care of prudent men engaged in the business."

Municipality Not Liable

Modern higher courts consistently hold that all persons who transact business with municipalities do so at their own risk. For illustration, in *Schumacher Stone Company v. Village of Columbus Grove*, 57 N. E. (2d) 251, it was shown that a stone company sued a municipality to recover $534, with interest, for crushed stone delivered to the municipality. During the trial it was shown that one state law provides that municipalities may not legally make any contract, or give any order for merchandise unless there is attached thereto a certificate of the fiscal officer of the subdivision that the money needed to pay for the merchandise has been lawfully appropriated for such purpose by bond issues. Another state law states that if the amount is less than $50, the fiscal officer may authorize it to be paid without the affirmation of the taxing authority of the subdivision. The stone company supplied the crushed rock without considering the above state laws. When it demanded payment the municipal officials refused the demand, and the company sued the municipality to recover payment for the stone.

The higher court held that the fact that the stone company failed to obtain from the municipal officials certificates for the crushed stone, amounting to $50 or less for each delivery, relieved the

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city from making the payments to the stone company. And the higher court refused to hold that the municipality must pay for the stone, although it was used on the city streets.

Also, see *Hawley v. City of Toledo,* 191 N. E. 827. In this case the higher court held that a seller could not recover payment for crushed stone and gravel supplied to a municipality where the testimony proved that the contract of purchase was not authorized by the city council as required by a state law.

And, also, see another leading case, *Village of Pleasant Ridge v. Dayton Limestone Company,* 1 Ohio App. 405, in which the higher court held:

"A cause of action or suit against a village is not stated on an account for material used in improving its streets, where there is no allegation that a certificate issued as to there being sufficient money in the treasury and unappropriated to meet the proposed obligation, or that advertisement was made for bids for the work, or that the obligation was to be met by the proceeds from an issue of bonds; nor can the argument prevail that because the material so furnished was actually used by the village it became morally bound to pay the claim."

Therefore, it is quite apparent that sellers of nonmetallic materials who would deal with a municipality must assume the risk that all necessary steps have been taken requisite to a legal contract.

In *McCloud & Geigle v. Columbus,* 44 N. E. 95, the court clearly explained why, in its opinion, all persons and companies which transact business with a municipality must know the law. This court said:

"An occasional hardship may accrue to one who negligently fails to ascertain the authority vested in public agencies with whom he deals. In such instances the loss should be ascribed to its true cause—the want of vigilance on the part of the sufferer, and statutes designed to protect the public should not be annulled for his benefit."

Employee a Minor

Generally speaking, the employment of any minor in violation of state laws may result in serious complications for the employer. In many states employers who employ minors are subject to payment of double compensation for injuries. See *In re West,* 46 N. E. (2d) 760, where it was shown that a young man less than 18 years of age was hired and put to work on a machine. One day while he was cleaning the roller, which was in motion, his arm was drawn into the machine and was so badly injured that amputation was necessary. He sued the employer for double liability. Although the lower court refused to hold in favor of the employee, the higher court reversed the verdict, and said:

"The evidence supports the finding that the employer knew that the employee was a minor."

Obviously in no suit involving injuries may the employee recover compensation, unless he proves that the injury arose out of the course of his employment, and that he himself was free from serious and willful misconduct.

Questions and Answers

[Mr. Parker will be glad to answer questions regarding legal problems of PIT AND QUARRY readers. Questions should be addressed to Leo T. Parker, Legal Editor, PIT AND QUARRY.—Ed.]

Legal Editor: Sometime ago we had a contract to purchase certain materials. When the time came for making the delivery the seller did not keep his contract because the government had appropriated all the material he had in stock. Can we do anything to recover the $2,740 we had to pay another concern to get this material?—G. R. P. C.

Answer: There is on record a recent higher court case in which it was held that under these conditions the seller must go into the open market and buy the merchandise necessary to fulfill the contract and deliver the goods to the buyer. Therefore, if you decide to file the suit write to me and I shall send your lawyer the citation of this decision which, it so happens, I do not have right at my finger tips.

Legal Editor: We will appreciate your explaining the federal wage and social security laws. When do we have to pay these?—S. B.

Answer: The matter of the Fair Labor Standards Act is pretty well settled. If you are in the retail business you do not have to pay the tax, provided a majority of your business is intrastate, and this means business with purchasers in your state. However, if you do interstate business, you may pay the wages specified by the law, although only a small percentage of your business is interstate business.

Now, with respect to social security you must pay this for all, whether in interstate or intrastate, provided the employees are not within a few of the restricted lines of employment, as house

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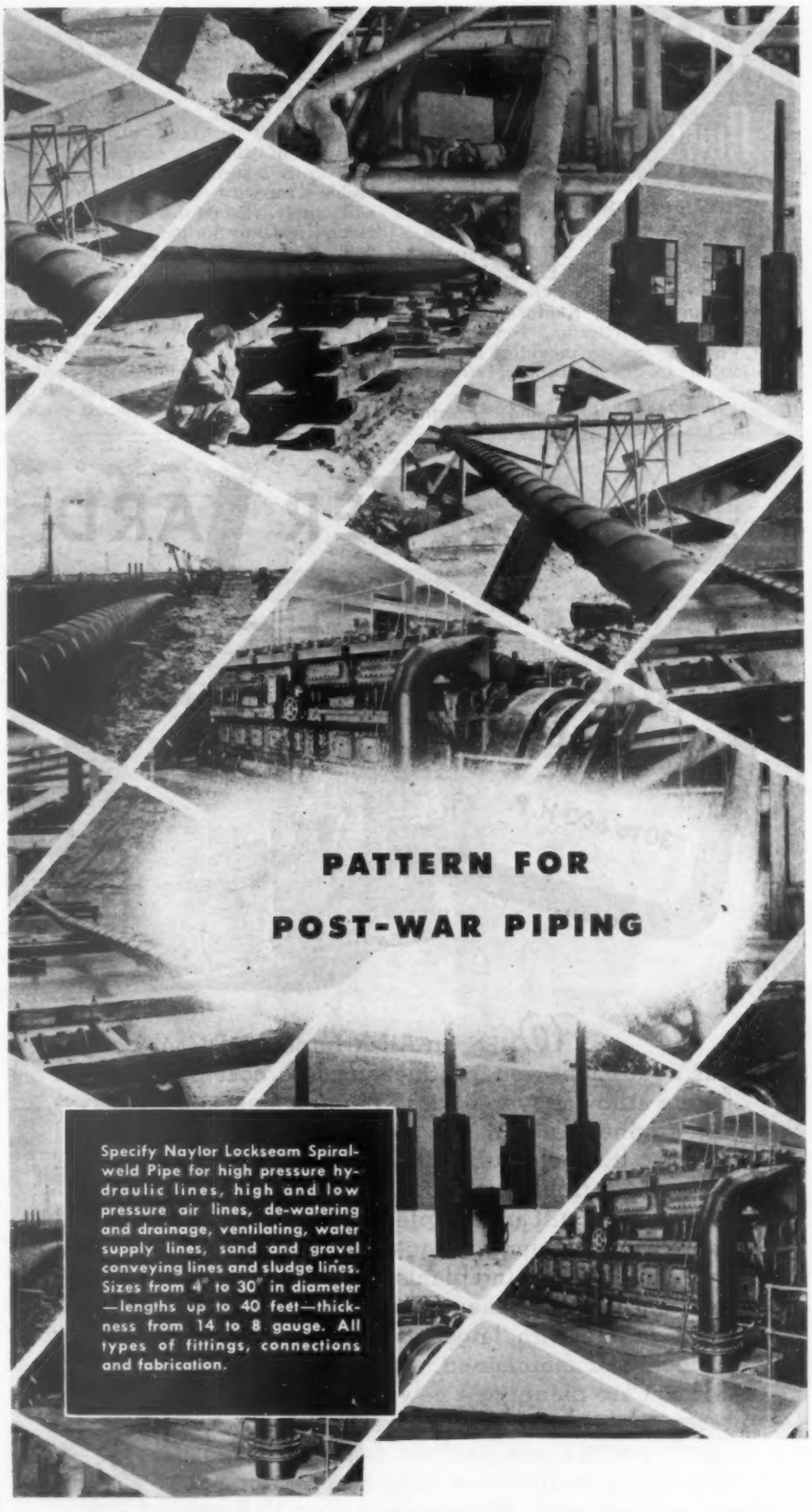
work, farm workers, and the like. It is not important whether the workers perform part interstate or other kinds of duties, if they are not within the few restricted employments. Of course, you may be doing entirely interstate business, and yet you will not have to pay the federal rate of wages to employees who do work not at all connected with your interstate business. In other words, only employees who handle, process or otherwise assist in the making or shipment, or transportation of interstate merchandise are within this law. Moreover, truck drivers who are under the control of the Public Service Commission are outside the Fair Labor Standards Act, so several higher courts have held.

Legal Editor: A driver was in charge of a trailer load of material. He was hired by a trucking company. The tractor to which this trailer load was attached was not owned by the trucking company but was owned by a party named White who leased it to the company. When the truck left on the trip the driver was in charge. Another driver employed by the company boarded the truck as a rider. Somewhere along the route the regular driver became sleepy and the rider-driver volunteered to take over driving the truck. While the latter was operating the truck he had a collision with another truck and the regular driver was instantly killed and the rider-driver was hospitalized. Both the regular driver and the rider-driver received their pay checks from the company and were paid on a round-trip basis. Expenses to the equipment such as minor repairs, grease, etc. on the road were paid by the drivers and they in turn were reimbursed for them upon completion of each round trip. The surviving family of the regular driver will receive workmen's compensation. What is the extent of liability on the part of White and what steps should be taken to recover damages?—A. S. & G. C.

Answer: The fact that White owned the tractor, and it was not owned by the company, is of little or no consequence. The important point is: Who controlled and directed the regular driver? I will explain a similar case decided only recently in which it was shown that a truck driver was paid and the truck was owned by, say, company "A". Company "B" had a contract to transport merchandise for another company, "C". Company "B" rented from company "A" both the truck and its driver. Company "B" officials directed the driver as to services performed without any interference from officials of company "A". The driver was killed. This higher court promptly held company "B" solely responsible.

In your case when the regular driver gave over the operation of his tractor to the rider-driver, neither driver was acting within the scope of his authorized employment unless, of course, officials of the company knew that in the past it was customary for drivers in direct charge of trucks to permit other company drivers to operate them. Under these conditions the company may be liable for the death of the regular driver. But White is not liable unless the testimony proves either that the accident resulted from the negligence of White's employees to keep the tractor owned by White in good repair, or that White had control over the regular driver and directed him regarding his duties and work. Under the latter circumstances White is the legal employer.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Specify Naylor Lockseam Spiralweld Pipe for high pressure hydraulic lines, high and low pressure air lines, de-watering and drainage, ventilating, water supply lines, sand and gravel conveying lines and sludge lines. Sizes from 4" to 30" in diameter—lengths up to 40 feet—thickness from 14 to 8 gauge. All types of fittings, connections and fabrication.
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TRAFFIC News Digest

CENTRAL FREIGHT ASSOCIATION

Docket 77438 (2).—Fullers' earth, carloads. Amend Item 1960-A, Sup. 63 and Item 1965 of C.F.A. TB Trf. 400-Q, publishing rates on, from Olmstead, Ill., to points in Indiana, Kentucky, Michigan, Ohio, Pennsylvania, New York, West Virginia, etc., by providing for the addition of Cox and Tamms, Ill., as origin points.

Docket 77448 (1).—Sand (except blast, core, engine, filter, fire or furnace, foundry, glass, grinding, ground loam, molding, molding-bonded naturally or otherwise, polishing, pulverized or silica or gravel, in open-top cars, c.l., minimum weight, except as otherwise provided, 90 per cent. of the marked capacity of the car, except that when the car is loaded to its full cubical or visible capacity, the actual weight will apply. Establish on, from Terre Haute, Ind., to Springfield, East Springfield, Buckhart, Roby, Mt. Auburn, Ill., 124 cents; Hammond, Pierson, Atwood, Garrett, Ficklin, Ill., 114 cents; Hume and Metcalf, Ill., 97 cents per net ton, *via* C.M.St.P.&P. West Dana, B.&O.

Docket 77463 (2).—Limestone, agricultural, unburned, in bulk in open-top cars, carload, minimum weight 90 per cent. of the marked capacity of the car, except that when loaded to its full cubical or visible capacity, the actual weight will apply. Establish on, from Speed, Ind., to B.&O. R.R. stations in Illinois, rates as shown in Exhibit D.

Docket 77501 (2).—Slag (a product of iron or steel furnaces, in bulk in open top cars, carload, minimum weight, 90 per cent. of the marked capacity of the car, except that when the car is loaded to its full visible capacity, the actual weight will apply. Establish on, from Grand Haven, Mich., to Richmond, Ind., 160 cents per net ton, *via* P.M. Ry., LaCrosse, Ind., and C.&Q. Ry.

Docket 77515 (2).—Limestone, agricultural, unburned, in bulk and stone, crushed, in bulk, carload, minimum weight 90 per cent. of the marked capacity of the car, except that when the cars are loaded to their full cubical or visible capacity, the actual weight will apply. Establish on, from Spencer, Ind., to Hovey, Griffin, Stewartsville, New Harmony, Martin and Armstrong, Ind., 127 cents per net ton, *via* P.R.R. Vincennes, Ind., C.&E.I. R.R., Poseyville, Ind., I.C. R.R.

Docket 77518 (1).—Sand, in open or closed cars, subject to the same commodity description and carload, minimum weight as now applicable in connection with rates in effect from the Vassar Group, as published in N.Y.C. R.R. Trf. 1908 and P.M. Trf. 5694-X. Establish on, from Vassar Group, viz.: Banksand, Millington, Watrousville, Juniata and McHale, Mich., 220 cents per net ton in closed cars; 204 cents in open cars.

Docket 77527 (2).—Sand and gravel in straight or mixed carloads, as described in Rule 15, Description A, I.C.C.R.R. Trf. 13321-I, minimum weight 90 per cent. of the marked capacity of the car, except that when the car is loaded to its full cubical or visible capacity, the actual weight applies. Establish on, from Riverton, Ind., to Huntington, Ind., 124 cents per net ton; Oakland City and Princeton, Ind., 121 cents applies only in open-top cars.

Docket 77532 (2).—Clay, common ground, carload minimum weight 60,000 pounds; except when a car of less capacity is furnished in which case the marked capacity of the car will govern, Rule 24 to Offl. Classn. not to apply. Establish on, from Minco, Mich., to various points in Illinois and stations in Iowa on the Mississippi River, rates as shown in Exhibit E.

Docket 77540 (2).—(a) Sand (except sand, molding, bonded naturally or otherwise, and except ground or pulverized sand) and gravel in closed equipment, minimum weight. See Note B: (b) Sand (except sand, molding, bonded naturally or otherwise, and except ground or pulverized sand) and gravel in open-top equipment (see Note A); minimum weight see Note B. Establish on, from Madison, O., to destinations in Pennsylvania and West Virginia, rates as shown in Exhibit B below.

Note A.—Rates will not apply on shipments in cars with tarpaulin or other protective covering. In such instances the rates applicable on shipments in closed cars are to be assessed.

Note B.—Minimum weight 90 per cent. of the marked capacity of the car except that when the car is loaded to its full visible or cubical capacity, the actual weight will apply, but orders will not be accepted for closed and open-top cars of less marked capacity than 60,000 and 80,000 pounds, respectively.

WHEN an Atlas Imperial Diesel powers your equipment you produce at less cost per yard . . . operate at lower over-all cost. Being a slow-speed, heavy-duty engine that will run efficiently on *any* diesel fuel . . . without special lube oils . . . an Atlas Imperial is your assurance of trouble-free operation.

Ruggedly-built and simple in design, the Atlas Imperial Diesel has extra lugging qualities that make it the ideal power unit for washing plants, dredges, crushers and other pit and quarry equipment. It is a low-firing-pressure, field-tested engine with large inspection doors that is easily serviced and maintained.

If you are planning a new power unit . . . or replacing present equipment . . . be sure to get all the facts about Atlas Imperial Diesel engines. Learn how these outstanding engines can help you produce at less cost per yard. Write stating your H. P. requirements, we'll answer by return mail.

ATLAS Imperial DIESEL ENGINES

ATLAS IMPERIAL DIESEL ENGINE CO.

228 No. La Salle Street, Chicago 1, Illinois, Room 1217

Branches in Principal Cities, Canada and Alaska

EXHIBIT B
(Rates in cents per net ton)
From Madison, Ohio, to:

	†Proposed Rates Col. A	Col. B
Brackenridge, Pa.	176	154
Glassport, Pa.	187	*143
Homestead, Pa.	176	*132
McKeesport, Pa.	187	*143
McKees Rocks, Pa.	176	*132
Midland, Pa.	165	143
Monessen, Pa.	198	*154
Vandergrift, Pa.	176	154
Weirton, W. Va.	187	165
West Homestead, Pa.	176	*132

†On basis of I.C.C. Dkt. 22907 scale, increased under Ex Parte 123.
*Single-line scale observed due to agreement with the P. & L. E.

Docket 77542 (2). — Agricultural limestone, unburned, not ground or pulverized, in bulk in open-top cars, carload, minimum weight 90 per cent. of the marked capacity of the car, except that when the car is loaded to its full cubical or visible capacity, actual weight will apply. Establish on, from Speed, Indiana, to representative destinations in Indiana on the N.Y.C. (C) R.R., rates as shown in Exhibit C below.

EXHIBIT C
(Rates in cents per net ton)
To N. Y. C. (C)—

	Proposed Rate
North Manchester, Ind.	154
Wabash, Ind.	149
Marion, Ind.	143
Fairmount, Ind.	138
Greensburg, Ind.	110
Letts, Ind.	105
Action, Ind.	121
Pittsboro, Ind.	127
Veedersburg, Ind.	143
Danville, Ind.	127
Lena, Ind.	138
Rock Island, Ind.	121
Whitestown, Ind.	127
Hazelrigg, Ind.	132
Templeton, Ind.	149
Muncie, Ind.	132
Parker City, Ind.	138
Union City, Ind.	143
Nulltown, Ind.	127
Connersville, Ind.	121
Trafalgar, Ind.	116
Kentland, Ind.	154
Free, Ind.	154
Tab, Ind.	154
Allison, Ind.	154
Coe, Ind.	121

Dock 77558 (2).—Sand, all kinds, and gravel, in open-top cars, carload, minimum weight, 90 per cent. of the marked capacity of the car, except that when the car is loaded to its full visible or cubical capacity, the actual weight will apply. Establish on, from Cleveland, O., to Plymouth O., 99 cents per net ton.

Docket 77571 (1).—Sand and gravel (except blast, core, engine, filter, fire or furnace, foundry, glass grinding or polishing, loam, molding and silica) in open-top cars, carloads, minimum weight, 90 per cent. of the marked capacity of the car, except that when the car is loaded to its full cubical or visible capacity, the actual weight will apply. Establish on, from Wolcottville, Ind., to Kendallville, Ind., 45 cents *via* P.R.R. direct, to meet motor-truck competition.

Docket 77574 (2).—Lime, common, hydrated, quick or slaked, also agricultural and fluxing, carload, minimum weight 30,000 and 50,000 pounds. Establish on, from Speed, Indiana, to representative stations in Illinois and Indiana, rates as shown in Exhibit C.

Docket 77595 (1). — Agricultural limestone, unburned, not ground or pulverized, in bulk, in open-top cars, carload, minimum weight 90 per cent. of the marked capacity of the car, except that when the car is loaded to its full cubical or visible capacity, the actual weight will apply. Establish on, from Speed, Indiana, to B.&O. R.R. stations in Indiana, minimum rates as shown in Exhibit F. *via* S. I. Ry., Watson, Ind., B.&O. R.R. or P.R.R. Seymour, B.&O. R.R.

Docket 77605 (2).—Sand, carload, as described in Agent Jones Tariff 555-A, Item 200, under A and C. Establish on, from Cleveland, O., to Elmira, N. Y., 264 cents per net ton, *via* P.R.R. direct.

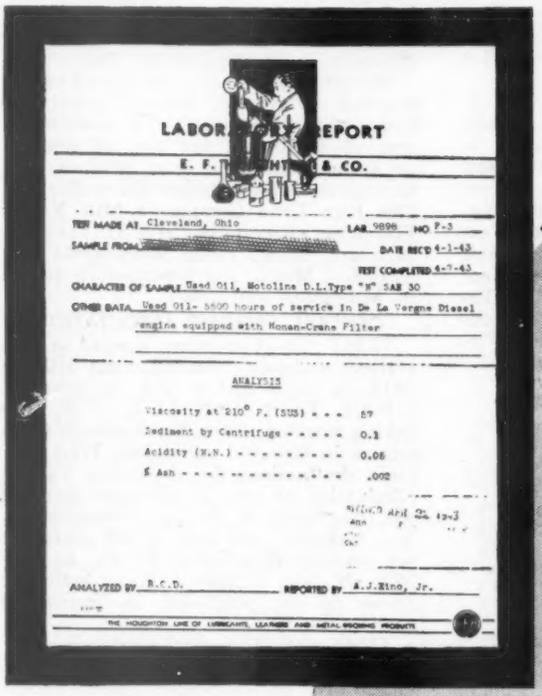
Docket 77615 (2).—Slag (a product of iron or steel furnaces) in bulk, in open-top cars, carload, minimum weight 90 per cent. of the marked capacity of the car, except that when the car is loaded to its full visible capacity, the actual weight will apply. Establish on, from Grand Haven, Mich., to Alexandria, Ind., 160 cents per net ton.

Docket 77642 (2).—Sand (except blast, core, engine, filter, fire, or furnace, foundry, glass, grinding or polishing, loam, molding or silica) and gravel, carload, in open-top cars, minimum weight 90 per cent. of the marked capacity of the car, except that when the car is loaded to its full cubical or visible capacity, the actual weight will apply. Establish on, from Irving, N. Y., to Kanona, N. Y., 154 cents per net ton.

Docket 77644 (2).—Sand (except blast, core, engine, filter, fire or furnace, foundry, glass, grinding or polishing, loam, molding or silica) and gravel, in open-top cars only, minimum weight 90 per cent. of the marked capacity of the car, except that when the car is loaded to its full capacity, the actual weight will apply. Establish on, from Peru, Ind., to Macy, Ind., 48 cents per net ton, *via* N.Y.C.&St.L. R.R. direct.

Docket 77695 (2).—Crushed stone and stone screenings, in bulk, in open-top cars, carloads, minimum weight, 90

5000 hrs. of perfect lubrication


LABOR REPORT
E. F. & CO.
TEST MADE AT Cleveland, Ohio
LAB 9896 HO P-3
SAMPLE FROM
DATE RECD 4-1-43
TEST COMPLETED 4-7-43
CHARACTER OF SAMPLE Used Oil, Motoline D.L.Type "N" SAE 30
OTHER DATA Used Oil- 5500 hours of service in De La Vergne Diesel engine equipped with Honan-Crane Filter
ANALYSIS
Viscosity at 210° F. (SUS) - - - 57
Sediment by Centrifuge - - - - - 0.1
Acidity (N.N.) - - - - - - - - - 0.06
% Ash - - - - - - - - - - - - - .002
ANALYZED BY R.C.D.
REPORTED BY A.J.Kino, Jr.

HONAN-CRANE "CONTINUOUS" OIL PURIFIER KEEPS LUBE OIL ENTIRELY FREE FROM DAMAGING CONTAMINATION

Reproduction of actual laboratory analysis of oil used for 5,500 hours in a De LaVergne Diesel engine equipped with a Honan-Crane "Continuous" Oil Purifier. In a letter accompanying this report the laboratory advises:

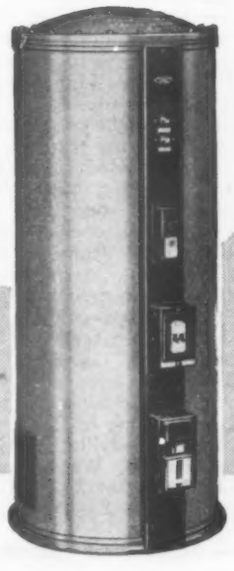
"We herewith enclose a laboratory report of Houghton Motoline D. L. Diesel Oil "N" SAE 30 after 5,500 hours of service in your De La Vergne Diesel Engine.

"This product is suitable for further service, as evidenced by its extremely low sediment, 0.1%, and negligible ash .002%. As the original oil has a viscosity of 55 seconds at 210°F. a rise of 2 seconds at this temperature is relatively insignificant. The Neutralization Number (acidity) has been unaffected by its length of service.

"From a study of this analysis we would recommend the use of this oil for at least another 2500 hours at which time it would be advisable to have the oil analyzed again."

HONAN-CRANE *Oil Purification Equipment* removes all damaging contamination as fast as it is liberated by the operating engine. This means minimum wear, less maintenance, longer engine life and lower operating costs.

This engine has operated 5,500 hours and a projected 2,500 hours on clean, fresh oil. If you are not getting results like these—you owe yourself a check-up. Write today for complete information on purification of Diesel Lube and Fuel oils, and specifications of Honan-Crane Equipment.



HONAN-CRANE CORPORATION
Subsidiary of Houdaille-Hershey Corporation

56 INDIANA AVENUE, LEBANON, INDIANA

per cent. of the marked capacity of the car, except that when the cars are loaded to their full cubical or visible capacity, the actual weight will apply. Establish on, from Bloomville, O., to Jonesville, Mich., 129 cents per net ton, to Hudson, Mich., 123 cents.

Docket 77698 (1).—Stone, viz.: Breakwater, chips, grout, rip rap and spauls, in straight or mixed carloads, minimum weight 90 per cent. of the marked capacity of the car, except that when the car is loaded to its full visible capacity, the actual weight will apply. Establish on, from Bedford, Coxton, Heltonville and Oolitic, Ind., to Ft. Benjamin Harrison, Ind., 145 cents per net ton.

Docket 77701 (2).—Sand (except blast, core, engine, filter, fire or furnace, foundry, glass, grinding or polishing, loam, molding and silica) and gravel, in open-top cars, carloads, minimum weight 90 per cent. of the marked capacity of the car, except that when the car is loaded to its full cubical capacity, the actual weight will apply. Establish on, from Riverton, Ind., to Washington, Ind., 105 cents per net ton, *via* I.C. R.R.—Olney, Ill.—B.&O. R.R., to expire one year from effective date of publication.

Docket 77702 (2).—(A) Sand (except sand, molding, bonded, naturally or otherwise and except ground or pulverized sand) and gravel in closed equipment, minimum weight, see Note B; (d) Sand (except sand, molding, bonded, naturally or otherwise, and except ground or pulverized sand) and gravel in open-top equipment, see Note A, minimum weight, see Note B. Establish on, from Madison, O., to destination in Pennsylvania and West Virginia, rates as shown in Exhibit C.

EXHIBIT C
(Rates in cents per ton of 2,000 pounds)

To:	Proposed Rates Col. A	Col. B
Aliquippa, Pa.	165	121
Butler, Pa.	165	121
Coraopolis, Pa.	176	132
Greensburg, Pa.	187	165
Groveton, Pa.	176	132
Johnstown, Pa.	209	187
Latrobe, Pa.	198	176
Neville Island, Pa.	176	132
New Castle, Pa.	154	110
Pittsburgh, Pa.	176	132
Trefford, Pa.	187	165
Uniontown, Pa.	209	187
Verona, Pa.	176	154

Docket 77709 (2).—Sand, except blast, core, engine, foundry, glass, molding or silica, and gravel, carloads, in open-top cars, minimum weight 90 per cent. of the marked capacity of the car, except that when the car is loaded to its full cubical or visible capacity, the actual weight will apply. Establish rate of 116 cents per net ton from Terre Haute to Coe, Ind.

Docket 77713 (1).—Slag, crushed or crushed commercial (not granulated) a product of iron and steel blast or open-hearth furnaces, in bulk, in open-top cars, carload, minimum weight 90 per cent. of the market capacity of the car, except that when the car is loaded to its full cubical or visible capacity, the actual weight will apply. Establish rate of 149 cents per net ton on from Hamilton, O., to Crane, Ind.

Docket 77714 (1).—Sand, all kinds, and gravel, carload, in open-top cars, minimum weight 90 per cent. of the marked capacity of the car, except that when the car is loaded to its full cubical or visible capacity, the actual weight will apply. Establish rate of 138 cents per net ton on from Troy, O., to Ashland, O.

Docket 77722 (1).—Lime, calcium, carbonate of (recarbonated waste), in packages or in bulk, carload, minimum weight 50,000 pounds, published in items 535 to 565 of D.T.&I.R.R. Trf. 1247M and similar rates in other individual lines tariffs. Cancel present rates on from Wyandotte, Mich., to various points in C. F. A. territory, representative of which are Akron, O., 14 cents; Chicago, 14 cents; Erie, Pa., 14 cents; Jackson, Minn., 9½ cents; Milwaukee, Wis., 17 cents per 100 pounds. Classification basis to apply in lieu thereof.

Docket 77719 (1).—Industrial sand, subject to Columns 1 and 2 ratings and minimum weights as described in P.M. Ry. Trf. 5694-K, ICC5248. Establish on from Hemlock-Paines, Mich., Group to Hamilton, Ont., 303 cents per net ton in open cars and 352 cents in closed cars.

SOUTHWESTERN FREIGHT BUREAU DOCKET

Docket 35789 (2).—Silica sand, Crystal City and Sand Pit, Missouri, to Wichita Falls, Tex. To establish a rate of $3.45 per net ton on silica sand, carload, from Crystal City and Sand Pit, Missouri to Wichita Falls, Tex.

Docket 35804 (1).—Limestone, crushed on ground, Missouri points, to Iowa and Minnesota. To establish a rate of $3.40 per net ton on crushed or ground limestone from Mosher, Ste. Genevieve, Marlo, Bonne Terre, Desloge, Doe Run Lead Company's Mill No. 3, Flat River, Rivermines and St. Francois, Missouri, to St. Paul, Minneapolis and Transfer, Minn., and intermediate points in Minnesota and Iowa.

CENTRAL FREIGHT ASSOCIATION

77563 (1)—Limestone, ground or pulverized, carloads. Amend items 5700 to 5814 on pages 210 to 213, inclusive, of C.F.A.L. Tariff 218-N, I.C.C. 3758, publishing rates on, from Northwestern Ohio origins in Group 1 to various West Virginia destinations, by providing for the elimination of rate of 259 cents per net ton from Clay, W. Va., to Walgrove, W. Va., inclusive, and rate of 248 cents per net ton from Blue Creek, W. Va., to Two Mile, W. Va., inclusive. Rates indicated above to be published in individual carriers' tariffs.

77746 (2)—Industrial sand; viz.: (a) sand (except sand, molding, bonded (naturally or otherwise) and except ground or pulverized sand) and gravel, in open-top equipment (see Note A), minimum weight (see Note B).

Note A—Rates will not apply on shipments in cars with tarpaulin or other protective covering. In such instances the rates applicable on shipments in closed cars are to be assessed.

Note B—Minimum weight 90 per cent. of marked capacity of the car except that when the car is loaded to its full visible or cubical capacity, the actual weight will apply, but orders will not be accepted for closed and open-top cars of less marked capacity than 60,000 pounds and 80,000 pounds, respectively. Establish on, from Hemlock-Paines, Mich., Group to Hudson, Mich., 138 cents in open cars and 176 cents per net ton in closed cars.

77748 (2)—Limestone, ground or pulverized, unburned, minimum weight 60,000 pounds. Establish rate of 226 cents per net ton on, from Woodville and Gibsonburg, O., to Sheldon, Webster and Watseka, Ill., I.C.C. Docket 25220 Carriers' Revised Scale, plus Ex Parte 123 increased.

77760 (1) — Agricultural limestone (not ground or pulverized), unburned, in bulk, loaded in open top cars only, carloads, minimum weight per car 90 per cent. of marked capacity of car except when car is loaded to full cubical or visible capacity actual weight will apply. Establish rate of 88 cents per net ton on, from Carey, O., to Houghtonville, Hereford, Nova, Sullivan, Homer, Lodi, Aukerman and Wooster, O.

77784 (2)—Sand (except sand, molding, bonded (naturally or otherwise) and except ground or pulverized sand) in open top equipment, carloads (see Notes 1 and 3), minimum weight 90 per cent. of marked capacity of the car is loaded to full visible or cubical capacity actual weight will apply, but orders will not be accepted for open top cars of less marked capacity than 80,000 pounds (see Note 2).

Note 1—Rates will not apply on shipments in cars with tarpaulin or other protective covering. In such instances the rates applicable on shipments in closed cars are to be assessed.

Note 2—When a shipper orders a car of above mentioned marked capacity or greater, and the carriers are unable to furnish car ordered and furnish a car of greater capacity than that ordered, the minimum weight for the car furnished will be that which would have obtained had the car ordered been furnished and used.

Note 3—The following provision where currently in effect on other sand than sand, molding bonded (naturally or otherwise), will be continued. Will not apply on sand processed beyond washing or screening for decolorizing, filtering or water softening. Establish rate of 187 cents per net ton on, from Solon, O., to Niagara Falls, N. Y.

77785 (2)—Sand, all kinds, and gravel, in open top cars, carloads, minimum weight 90 per cent. of marked capacity of car, except when car is loaded to full visible or cubical capacity, actual weight will apply. Establish rate of 105 cents per net ton on, from Solon to Ceico, O.

77786 (1)—Cement, carloads. Amend agency and individual carriers' tariffs naming rates on, from producing points in C.F.A. territory to New Richmond and Ripley, O., by revising such present rates (where necessary) so that they will reflect an arbitrary of 5½ cents per hundred weight in excess of present rates from the same origins to south bank points of New Richmond and South Ripley, Ky.

77802 (1)—Sand (except blast, core, engine, filter, fire or furnace, foundry, glass, grinding or polishing, loam, molding or silica), and gravel, in open top cars, minimum weight 90 per cent. of marked capacity of car, except when car is loaded to full cubical or visible capacity, actual weight will apply. Establish on, from Hamilton, O., to Batesville, Ind., 110 cents per net ton.

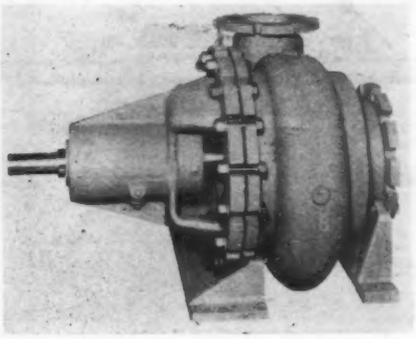
77803 (1) (a)—Gravel, in open top equipment. Establish on, from North Randall, Solon, Geauga Lake, and Aurora, O., to Niagara Falls, N. Y., 187 cents per net ton, Note 1; to Ceico, O., from North Randall, O., 99 cents; Solon, O., and Aurora, O., 105 cents per net ton. Note 2.

77820 (1) — Agricultural limestone, unburned, not ground or pulverized, in bulk, in open top cars, carloads, minimum weight 90 per cent. of marked capacity of car, except when car is loaded to full cubical or visible capacity, actual weight will apply. Establish on, from Speed, Ind., to C.M.St.P.&P. R.R. stations in Indiana shown in Exhibit B.

NEW MACHINERY and SUPPLIES

● New Slurry Pump

The Allis-Chalmers Manufacturing Company has announced its new type CW slurry pump, designed for handling solid, abrasive and corrosive materials

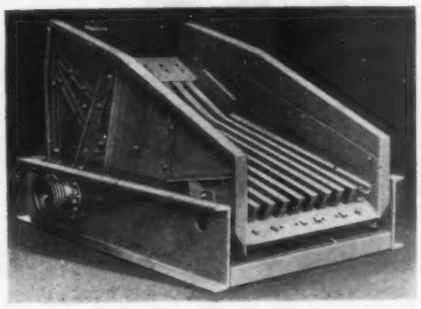


Simplified design results in fewer parts.

and for sludge disposal. The pump is constructed of a tough, abrasive-resistant alloy developed for exclusive use on Allis-Chalmers products. The simplified design of the entire unit results in fewer parts, and consequently requires the minimum of maintenance. It is possible to remove the entire rotating element without disturbing the suction or discharge piping. Stocks of complete units, as well as expendable replacement parts, will be maintained by Allis-Chalmers in strategic areas. Seven sizes of pumps have been developed to handle up to 7,000 gallons per minute.

● Vibrating Bar Grizzly

The Symons vibrating bar grizzly is for scalping service where clear spacings of 2½ inches and larger are permissible. The vibratory motion makes this grizzly



The tapered bars are of heavy manganese steel.

particularly effective for materials that are wet, sticky and gummy. As the rock falls on the bars this motion separates the smaller adhesive particles from the larger pieces. Toward the discharge end these smaller sizes rapidly drop through the bar openings as the vibration gradually assumes a more horizontal, straight-line motion.

The bars are of heavy manganese steel, slightly diverging and tapered end to end and top and bottom. The shape and angle of inclination of the bars and the vibration developed tend to bring about a non-clogging scalping action. The grizzly is built in one size—42 inches in width, with a clear lengthwise opening of 5 feet.

● Absorbent Sweat Band

An absorbent sweatband designed for foundrymen, welders and all workers on hot jobs has been announced by the American Optical Company of Southbridge, Massachusetts. The band is made of synthetic sponge; it is 7¼ inches long and covers the greater width of the brow. The manufacturers state that by keeping perspiration out of the eyes and off goggles, the band will help reduce the possibility of accidents resulting from blurred vision. The pad can be sterilized for continual use.

● Safety Glove

A new safety glove made from high-grade chrome-tanned cowhide has been developed by the American Optical Company, Southbridge, Massachusetts. The glove may be worn for hand protection in welding and in other heavy-duty operations. The principal feature of the glove is its one-piece back construction. There are no seams to catch sparks or molten metal.

● Ore Drilling Machine

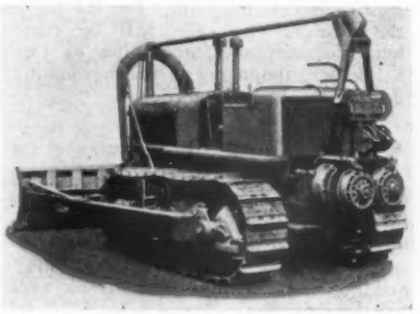
The Galena Machine & Electric Company of Galena, Kansas, has developed a unique portable ore-drilling machine which is said to enable 2 drillers to do as much work as 6 using the post or tripod method. The rig is mounted on a Caterpillar tractor in which the prime mover has been converted to operate on compressed air by the installation of an air head with four slide valves. An air receiver, fabricated of 8-inch pipe, is mounted on the side of the tractor just above the tracks to supply air to operate the Caterpillar motors, two rock drills, and a small air-driven winch by means of which the drilling boom may be raised or lowered to the proper height at the ore face.

The drill operators stand on a small platform which is hinged to the boom at the back and supported in front by a chain which may be adjusted to maintain a level position regardless of the angle at which the boom is set. Two rock drills may be mounted on the 3-inch diameter by 8-foot long pipe which is fastened in two clamps at the end of the boom.

The entire self-contained rig may be quickly shifted from one drilling location to another and long multiple air-hose lines, heavy drilling posts and time-consuming set-up adjustments are said to be eliminated by its use. The "Jumbo," as it is called, was one of the prize-winning entries in a recent arc-welding contest.

● Bulldozers & Gradebuilders

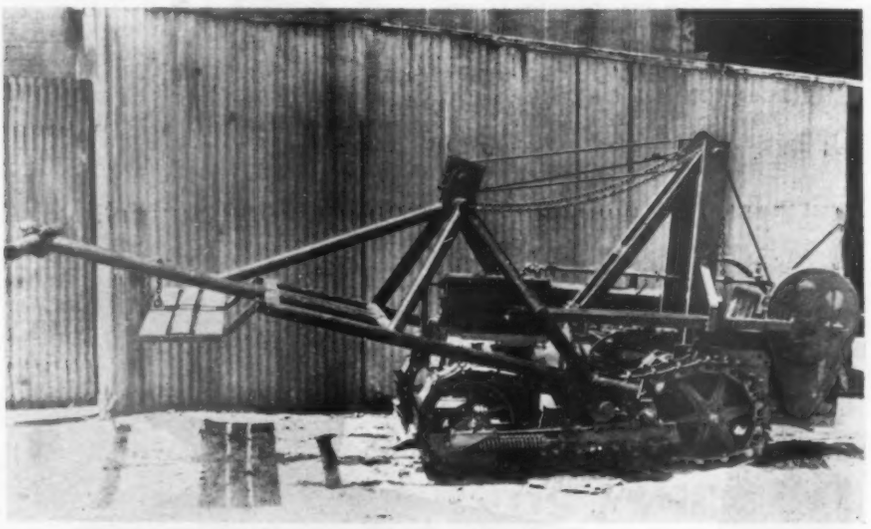
The Baker Manufacturing Company, Springfield, Illinois, announces a line of cable-controlled bulldozers and grade-



New units feature reinforced tubular arch and box-welded moldboard.

builders and power control units made exclusively for Allis-Chalmers HD-14, HD-10 and HD-10-W tractors. Special features include a reinforced tubular arch, a box-welded moldboard, 5-position side arms which permit tilting of the blades up to 10 inches on the bulldozer and 12 inches on the gradebuilder, a 42-inch blade lift above ground on the bulldozer and 50 inches on gradebuilders. The blade drop below ground level is limited only by the length of the cable.

The power control units feature differential or self-energizing brakes whereby the dead-end load aids the spring in setting the brake and is so arranged that the differential factor increases as the band lining wears. "Air-conditioned" cone-type clutches and band brakes are employed. All adjustments are made from the rear. The drum barrel is curved at the anchor end, which causes the rope to wind closely at the outset.



Two rock drills may be mounted on the pipe at the end of boom.

● Rubber Gas Tanks

One product of war that promises to go to work for peace-time industry is the rubber gasoline tank. Thick, bullet-sealing tanks for airplanes have been used since the early days of the war. Now, in addition to their prime purpose, these tanks are found to reduce gasoline leakage due to other causes.

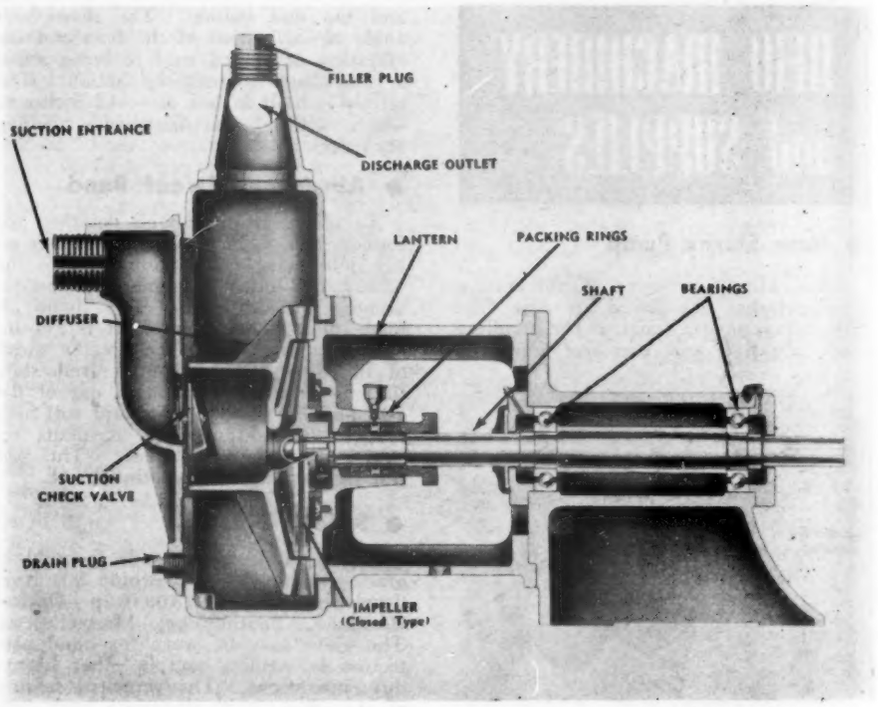
Non-combat airplanes and later trucks and buses may use a modification of the bullet-proof tank. The rubber cells would be much lighter and simpler, being actually rubber bags or bladders tailored to fit into the tank space.

These rubber cell gasoline tanks will protect fuel supply against many leaks, and also, being flexible, resist the effects of minor crashes which in airplanes often split or buckle the tank. For the present the bladder-type cells will be custom built for airplanes, according to James S. Pedler, manager of the aeronautical division of B. F. Goodrich.

● Self-Priming Pump

A recent publication issued by Marlow Pumps, Ridgewood, New Jersey, describes the construction and performance of their new self-priming centrifugal pump, which features the principle of diffuser priming, as distinguished from recirculation priming.

The new type of priming is thus described: "The priming liquid is not returned to the suction side of the pump, but mixes with the air at the periphery of the impeller. . . . The entire periphery of the impeller is sealed by the reservoir liquid, and the liquid is repelled from returning to the suction by the revolving impeller vanes. During this repelling of the reservoir liquid by the impeller vanes . . . the air is expelled through the diffuser passageways and escapes by bubbling to the surface of the liquid. . . . This action goes on until all air is eliminated. At this time, liquid fills the suction line and pumping begins."



Self-priming centrifugal pump features principle of diffuser priming.

The pumps are built in a variety of sizes, capable of delivering up to 4,000 gallons per minute and developing pressures up to 150 pounds. They can be used with gasoline and Diesel engines, electric motors or steam turbine power.

● Portable Lubricator

Stewart-Warner's new portable electric power guns were designed specifically for use where air power is not available or where electrically operated equipment is desirable. Available in two types—Model 7190 with three large ball-bearing casters for smooth, level surfaces and Model 7091 with two large rear wheels and one front caster for rough, uneven surfaces—these guns are powered by heavy-duty capacitor 1/3 horsepower motors. They develop 4,500 to 5,000 pounds of lubricant pressure.

Large rear wheels are for rough surfaces.

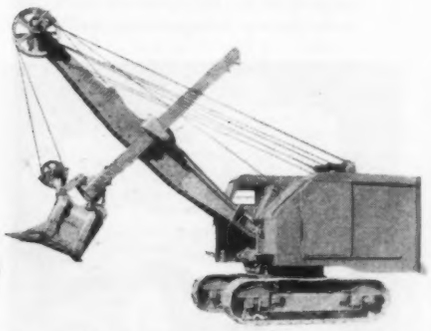
Among other special features of the new equipment are its mercury pressure switch, which is adjustable and automatically activated by lubricant back pressure in the hose; a 25-pound lubricant container; controlled lubrication; a hose hanger; and a high-pressure steel piston and cylinder.

A big mouthful with every bite
In dirt, clay, coal, gravel or ore you can rely on one of the tough, properly designed, Brownhoist buckets to take a full load with every bite. Extra large sheaves reduce rope wear to a minimum. Brownhoist Buckets are available in rope-reeve, power-wheel and link type. For prices and further facts write INDUSTRIAL BROWNHOIST CORPORATION, Bay City, Michigan. Offices in New York, Philadelphia, Pittsburgh, Cleveland and Chicago.
BROWNHOIST BUCKETS
GIVE MORE YEARS OF
TROUBLE-FREE PERFORMANCE

● Shovel-Crane-Dragline

A new 1½-cubic-yard shovel-crane-dragline, the Koehring 605, has been announced by the Koehring Company, Milwaukee. Three basic requirements have been stressed in the design of the 605: ease of operation, basic strength and simplicity, and quick convertibility.

The main drum clutches are of a new design, power-engaged but manually released. Independent power or live boom control or a combination of both are available. The shovel dipper trip is the trigger-fast pawl-and-ratchet



The 1½-cubic-yard unit is pin-mounted for quick conversion.

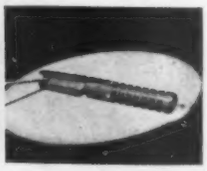
type, exclusive on Koehring excavators. A new double fulcrum linkage, eliminating the undesirable partial engagement of the unused clutch, has been added to facilitate the operation of crowd-retract and swing-traction clutch levers. The high A frame is raised or lowered by power; hook rollers are easily adjusted.

The main shafting on the 605 is straight; shoulders and keyways have been eliminated. Separate crawler frames give the lower assembly added flexibility. The 605 shovel boom has an improved foot shock absorber. A simplified shipper shaft assembly was designed to be easily removable. The 605 dragline fairlead is pin-mounted for quicker conversion.

● Electrode Holder

A new screw-type electrode holder—one-third lighter than the corresponding size clamp-type holder to decrease fatigue

Light unit.



Heavy duty.

—has been announced by the Allis-Chalmers Mfg. Company.

The exposed metal surfaces of the new electrode holder are constructed of spatter-resistant Mallory metal. Simplified design facilitates easy replacement of parts, and heavy insulation and adequate handle ventilation provide cool operation. The device is available in light and heavy duty sizes to accommodate electrodes up to ⅜ inch diameter.

● Car Puller

American Engineering Company, Philadelphia, announces the introduction of their new Class 2½ Lo-Hed Car Puller. The Lo-Hed Car Puller is a husky hauling device in which the barrel, gear box and motor are integrated in a single, streamlined unit. Starting line pull is 5,000 pounds, using a single line, or more with various block combinations. Uses of the car puller range from hauling railroad cars of all types to pulling skids, powering boat and airplane runways, dragging logs, bending pipe and numerous other backbreaking operations where imagination sees its possibilities.

● Mica Tester

This young woman is operating an electrical set for testing mica for war use. The development and use of this apparatus has greatly helped to meet a critical wartime shortage in this mineral.

Mica's special insulating qualities are important in communications equipment. With so much of this equipment needed, it soon became evident that the shortage would be serious unless something was done.

How could more mica be obtained? Under the old visual methods of testing, much good mica was discarded with the bad. Bell Telephone Laboratories' scientists, assigned the task of finding more mica, developed the testing apparatus shown above. With it the usable amount of mica has been increased by half and so has stretched the current supply of mica to fill all military needs.

● Cross-Flow Classifier

Denver Equipment Company has just announced its new Cross-Flow Classifier. The design incorporates two outstanding features which represent major developments in the classification field. The classifier derives its name from the "cross-flow" principle of operation. The overflow weir is on the side opposite the feed, rather than on the end of the classifier; the conveyor flights are in line with the direction of pulp flow across the classifier. These features permit an uninterrupted, smooth flow of pulp across the classifier from feed entrance to overflow weir. The Cross-flow Classifier eliminates the submerged bearing which has commonly been used in "spiral" type classifiers. The lower bearing is placed somewhat below the middle of the shaft, but above the maximum pulp level. Thus, the bearing is more easily serviced, no special packing or pressure lubrication

Scrapers and Cableways

for Dig-and-Haul Jobs

Above picture shows how a Sauerman Slackline Cableway digs deep under water and lifts gravel to a hopper on top of a screening plant. The operating cost is only a few cents per cubic yard handled and the machine cleans up every yard of material within a 700-ft. radius of the plant. This machine was installed in 1919 — has handled several million cubic yards at three locations — is still as good as new.

Write for Catalog

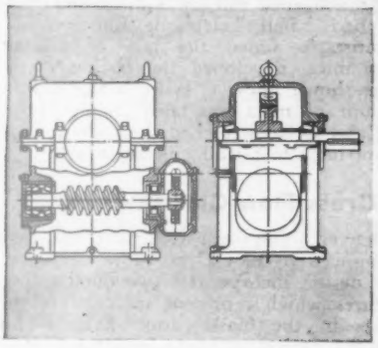
Where materials are to be moved distances of several hundred feet or more, a SAUERMAN Drag Scraper or Cableway can cut the cost to a low figure because it is able to dig, haul and place the material in a continuous automatic movement, without aid of other machinery. The operation is smooth and rapid, producing large yardage with moderate expenditure of power.

The first cost of a SAUERMAN Machine is reasonable, maintenance amounts to very little, and the simplicity of operation makes it possible to place the control of even the largest installation in the hands of one operator. Moreover, the machine is very flexible, hence easily adapted to changing conditions.

SAUERMAN BROS., INC.

534 S. Clinton St., Chicago 7

LUBRIPLATE No. 8



FOR HEAVY GOING

LUBRIPLATE No. 8 possesses an extremely high film strength and is just the correct density for the general run of enclosed gears (speed reducers). It is especially suitable for worm gears and other types carrying heavy loads. Typical of all LUBRIPLATE lubricants, No. 8 has exceptionally long life.

℞ FOR YOUR MACHINERY

No. 3—Ideal for general oil type lubrication. Ring oiled bearings, wick feeds, sight feeds and bottle oilers.

No. 8—Because of its high film strength and long life reflects outstanding performance in most types of enclosed gears (speed reducers).

No. 107—One of the most popular grease type products for general application by pressure gun or cups.

No. 70—For a wide range of grease applications, especially at temperatures above 200 degrees F.

No. 130-AA—Known nationwide as the superior lubricant for open gears, heavy duty bearings, wire rope, etc.

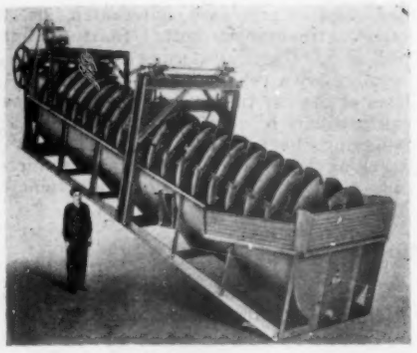
BALL BEARING—This is the LUBRIPLATE lubricant that has achieved wide acclaim for use in the general run of ball and roller bearings operating at speeds to 5000 RPM and temperatures up to 300 degrees F.

Write for a booklet, "The LUBRIPLATE Film", written especially for your industry.

LUBRIPLATE

FISKE BROTHERS REFINING CO.

NEWARK 5, N. J.
TOLEDO 3, OHIO



New classifier.

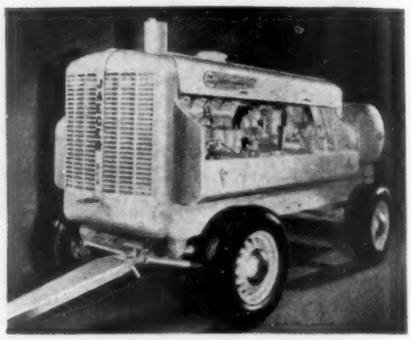
is required, and danger of bearing trouble from sandy pulp is eliminated. The Denver Cross-Flow Classifier is made in eleven simplex sizes from 6 inch to 60 inch and seven duplex sizes from 24 inch to 60 inch.

● Driv-Lok Pins

The Driv-Lok Pin Company, Chicago, announces a complete line of standard and special self-anchoring, vibration-proof pins, which are designed to replace more expensive taper pins, keys, cotter pins, set screws, rivets, etc. These pins, which are pressed or driven into standard drilled holes, have four flutes on the surface parallel to the axis. The length and position of the flute can be controlled accurately, so that fully or partially grooved pins are available. Fully grooved pins have a pilot at one end so that the pin can be easily inserted. The raised, work-hardened edges of these flutes provide an expanded diameter of a few (specified) thousandths greater than the nominal diameter of the pin. When the pin is inserted in a drilled hole, these raised edges are compressed inwardly, providing a resilient, self-locking element which, it is claimed, will hold indefinitely under vibration or shock conditions. They are available in sizes from 3/6 inch to ½ inch diameter, and from 3/16 inch to 4½ inch in length, in any material, and in a wide variety of types.

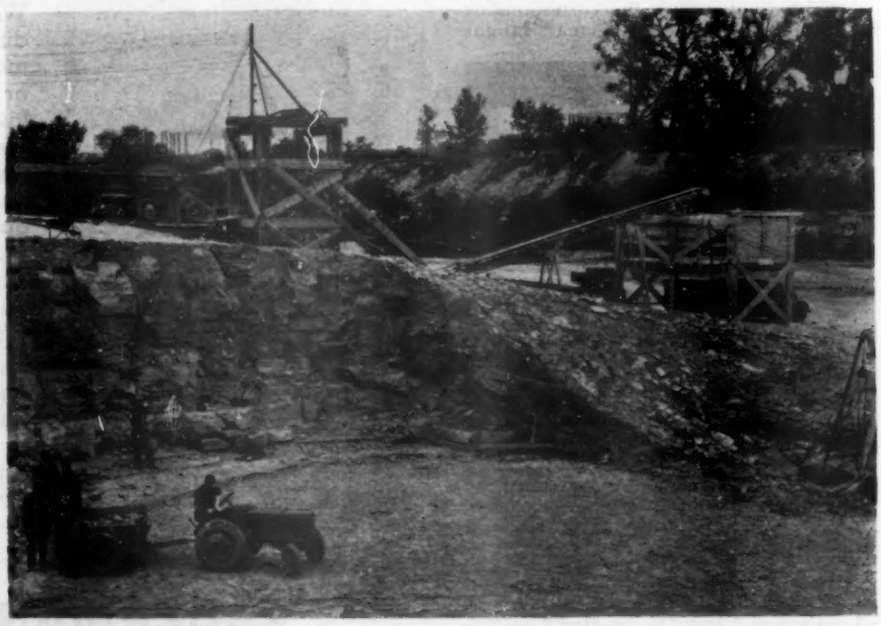
● Air Compressors

The Jaeger Machine Company, Columbus, Ohio, is producing a complete line of both portable and stationary air compressors of 60 to 500 cubic-foot capacity. Advances in air cooling, derived from war experience, have simplified control of the heat and condensation which result when air is compressed. Air-animated "Tough Swedish Twin" valves of unusual size and high lift insure free air flow without back pressure. By this valve action, in combination with improved cylinder radiation and more efficient intercooling, air compressed to 100 pounds per square inch is held to a temperature within 100



Portable compressor.

degrees of the ambient atmosphere, eliminating both the danger of over-heated tools and the pressure losses caused by sharp drops in temperatures in long air lines. The compact "W" arrangement of the compressor cylinders permits the use of a short crankshaft and closely spaced main bearings and also provides easy access to the valves and parts. Valves and pistons are interchangeable throughout. To meet the rigorous requirements of field service all units have full force feed lubrication, the bearings and twin disc multiplate clutches are designed for lifetime service, and grouped control panels, unusually large air receivers, sectional radiator grills, extended lubrication fittings and protected fuel tanks are standard features. Gas, Diesel or electric



Two Model 1B Allis-Chalmers tractors and 2-wheel rock carts, owned by Wapello County, Iowa, haul stone from quarry floor up a ramp and dump it into a Grundler crusher.

powered models are available with either direct or belt drive. Portable models are equipped with roomy tool compartments and mounted on massive structurally welded steel frames with spring axles, Timken or anti-friction roller bearing steel or pneumatic tired wheels. Automotive-type pivot steering axle on 210 ft. or larger sizes is standard.

● Safety Hook Latch

The Thomas Laughlin Company of Portland, Maine, announce a newly designed latch for their safety hooks, which have been widely used for general hoisting and materials handling, plane and cargo lashing, suspending tools, etc. This improved latch gives 80 per cent. of the full throat opening, and its proper operation decreases the possibility of overloading and overcrowding.

The wider throat opening results from the way in which the latch assembly, when open, straddles the neck of the hook. The load to be hoisted is easily

Latch retains 80 per cent. of throat opening.

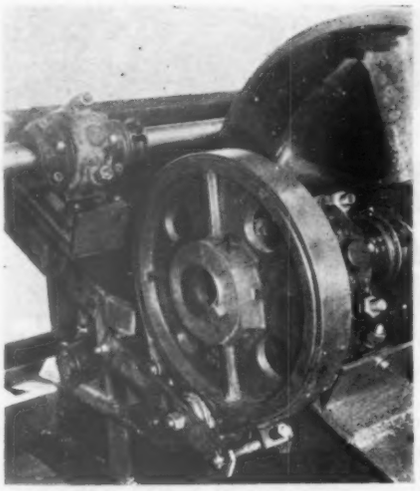
slipped into the hook but cannot be removed until the operator's fingers release the latch, thus preventing the risk of dropping loads and endangering bystanders. If the hook is overcrowded, the latch will not snap into place. If the hook spreads because of excess loading, the latch pops up as a warning signal.

Made of pressed steel in the smaller sizes and cast bronze in the larger, this latch is riveted at the neck of the hook to a cam which is an integral part of the hook forging. The latch is actuated by a corrosion-resistant stainless steel wire spring, which coils around the hub of the cam on each side and extends down the inside of the latch.

Safety hooks with these new latches are modifications of standard eye, straight-shank and swivel types, with safe working-load capacities from one-half to fifteen tons.

● Conveyor Backstop

A shoe acting directly on the brake-drum is one of the features of a new differential band-type backstop recently announced by the Barber-Greene Company of Aurora, Illinois. The new backstop is designed to prevent belt conveyors or bucket elevators from running backwards when, for any reason, the power is shut off. It also provides more frictional area, requires less tension in the band and reduces the danger of bending of the shaft. Instead of the brake band taking all the torque required to hold the conveyor, the shoe takes an appreciable part of the load. When the differential acts and the band tightens, the shoe is pulled up against the drum with great force, giving added friction.



Differential, band-type backstop.

● Tram Cars

The Lake Shore Engineering Company of Iron Mountain, Michigan, cites the following outstanding features of its new Lohed tram cars: stiffer construction with

Pivot point of new car is inside the wheel line.

weight not exceeding 6,100 pounds; doors guided into and out of closing position, rather than suspended; easy accessibility to the wheels for rerailment; pivot point inside the wheel line for easy dumping; camel-back dumpers; standardization of track gauge, wheel base and body size; rounded corners to permit clean dumping.

The *Marmon-Herrington News,* published by the Harmon-Herrington Company, Inc., of Indianapolis, featured in its April number the tanks, trucks, bulldozers and other equipment furnished by the company to the armed forces. Included also was an account of the Navy-Army "E" recently awarded to the firm and news about Marmon-Herrington men in service.

Iron Men of Hendy, the attractive news magazine published by the Joshua Hendy Iron Works of Sunnyvale, California, appropriately employed for its March-April cover picture a photograph of President Harry S. Truman (then senator) and Charles E. Moore, president of the company. The photograph was taken two years ago while President Truman was touring the plant.

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Call Ryerson when you need steel—any kind, shape, or size. Large stocks are available at ten convenient plants. Ask for a Ryerson Stock List—your guide to quick shipment of steel.

Principal Products Include:

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JOSEPH T. RYERSON & SON, Inc.

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Commonwealth Building — Allentown, Pa.

VOLUME PRODUCTION

to meet the Growing Demands of War and Industry for

WISCONSIN Air-Cooled ENGINES

Highly systematized, progressive assembly of Wisconsin heavy-duty air-cooled engines keeps them coming off the production line in a steady, uninterrupted stream. Every operation is handled by a thoroughly trained workman who performs his specialized job with speed and skill.

The picture shows a run of Model VE-4, V-type, 4-cylinder engines going through . . . for power destinations on many types equipment. Perhaps one of these heavy-duty engines has been reserved for service on *your* equipment.

Most H.P. per pound

WISCONSIN MOTOR Corporation

MILWAUKEE 14, WISCONSIN, U. S. A.

World's Largest Builders of Heavy-Duty Air-Cooled Engines

UP!... Tonnage Handled

when you use the

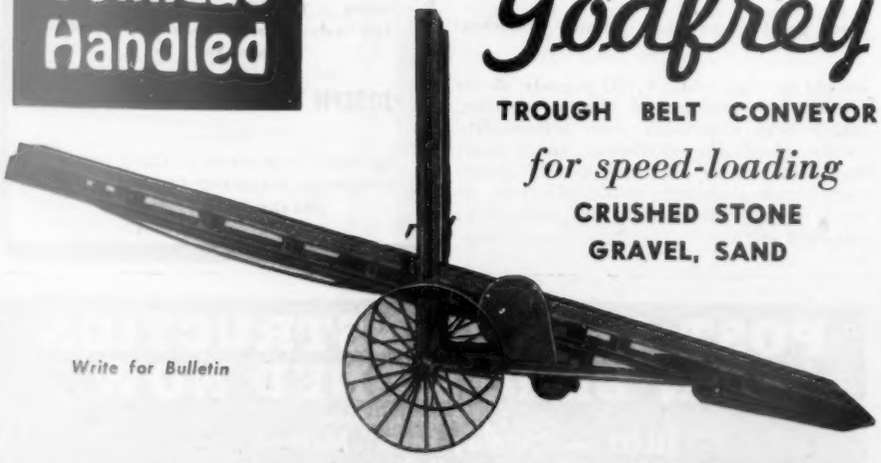
Godfrey

TROUGH BELT CONVEYOR

for speed-loading

CRUSHED STONE

GRAVEL, SAND



Write for Bulletin

HOW do short-handed quarrymen and contractors meet growing production demands *profitably*?—with GODFREY mechanical conveyors, of course!

These fast-loading, durable units come fully equipped, in various lengths, either electric or gas drive.

GODFREY machines are "tops in maneuverability," simple and easy to operate for unskilled workmen, and a sure cure for slow, costly hand loading.

GODFREY CONVEYOR CO., Elkhart 6, Ind.

DOWN Loading Costs!

TRADE NOTES

Bemistory, a 24-page monthly magazine published for employees of the Bemis Brothers Bag Company, St. Louis, Missouri, recently won three awards in a contest sponsored by the Industrial Press Association of Greater St. Louis. The publication, which goes to all former Bemis employees now in the armed services, scored highest in industrial journalism, presentation of personals, and features.

Marshal L. Noel

Marshal L. Noel, long identified with the Allis-Chalmers crawler tractor and road machinery sales, has been appointed general sales manager of the company's tractor division.

Promotions also went to W. J. Faulkner, named industrial sales manager, and H. A. Gratner, newly appointed agricultural sales manager.

The Lime & Hydrate Plants Company, York, Pennsylvania, has announced the establishment of its own shop in York, where the design and production of lime burning and lime hydration equipment will occupy the full time and energies of its personnel. The firm will build its own specialties, rather than depend upon associated companies which formerly supplied accessories for lime and hydrate plants.

William J. Kuntz, president of the Lime & Hydrate Plants Company, stated that the firm would continue to service York Kuntz Automatic Kilns; the Kuntz gravity system of lime hydration; and Kuntz, Shaffer, Clyde and Schulthess hydrators and similar installations.

Pictured after their marriage in New York are Ensign and Mrs. Gene Olsen, Jr., and members of the bridal party. Left to right: C. E. Ehle, president of the National Concrete Manufacturers

Association; Mrs. E. F. Olsen; Ensign Olsen; Mrs. Olsen; Gene Olsen, president of the Stearns Manufacturing Company, Inc.; Mrs. C. E. Ehle; E. W. Dienhart, executive secretary of the N. C. M. A.

Ensign Olsen is a director of the Stearns Manufacturing Company.

R. E. Birch

The Harbison-Walker Refractories Company has announced the appointment of Raymond E. Birch as director of research, to succeed Fred A. Harvey, who died recently. Mr. Birch has long been active in the ceramics industry and allied fields; he has been associated with Harbison-Walker since 1930.

Colonel Charles A. Selby, secretary-treasurer of Wininger & Selby, Inc., and treasurer of the Nicholson Company, Inc., has been awarded the Bronze Star for meritorious achievement during military operations on Kwajalein and Eniwetok in the Marshalls. He is a member of the General Staff Corps, Pacific Ocean Areas.

Col. Selby

A. A. Nelson

A. A. Nelson, formerly associated with the Nicholson Company, Inc., New York, designers and builders of concrete storage facilities, has rejoined the firm as vice-president. During the past two years Mr. Nelson was engaged in designing and construction work for the Defense Plant Corporation facilities in the Middle West.

The Caterpillar Tractor Company, Peoria, Illinois, has announced the following new appointments: F. D. Haberkorn, assistant sales manager of the Central Sales Division; C. A. Barabe, Jr., assistant sales manager of the Eastern Sales Division. F. E. Rusher, formerly assistant sales manager of Central Sales, has resigned his position to become general sales manager and a director of the Peoria Tractor & Equipment Company.

Oliver United Filters Inc., New York, Chicago, and Oakland, California, has announced the appointment of Leon D. Thompson as export sales manager.

The Hercules Record, published by A. Leschen & Sons Rope Company, St. Louis, Missouri, carried an announcement of the appointment of Douglas W. Vernon as general manager of sales for the firm.

The Nordberg Manufacturing Company, Milwaukee, has announced the return of G. J. Brown to active duty as overseas manager of its London branch offices. Mr. Brown has been in charge

G. J. Brown

J. P. Burl

of essential war production for the British government for the last five years. Nordberg interests in Great Britain, Continental Europe, the Scandinavian nations, North Africa and certain parts of the British Empire now are under his jurisdiction.

Nordberg simultaneously announced the appointment of J. P. Burls, formerly chief engineer (overseas), to the position of South African branch manager. He will have headquarters in Johannesburg and will be in charge of all Nordberg affairs in South Africa.

The New England Traffic Division of Wickwire Spencer Steel Company recently moved its Worcester headquarters to New Bond Street, Worcester 6, Massachusetts. Announcement of two promotions also was received—Joseph S. Sampson to the position of assistant to Harry H. Marsales, general traffic manager; and Donald J. Carey to the office of division traffic manager in charge of the New England division.

PERFORATED METAL SCREENS

FOR SAND, GRAVEL STONE, ETC.

Manufactured exactly to your specifications.

Any size or style screen, in thickness of steel wanted with any size perforation desired.
We can promptly duplicate your present screens at lowest prices.

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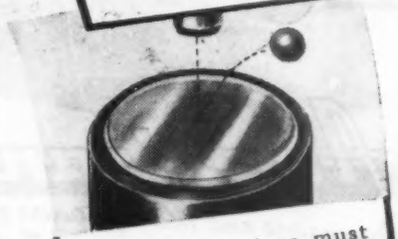
Willson Safety Spectacles

20 SIZES

So You Can Fit Anybody!

Why 20 sizes? Because it takes that many to fit every type of face accurately. And, above all, *comfortably*. Result—workers keep them on. Injury rates come down. Efficiency goes up.



Every Willson lens must pass most rigid tests. Federal drop-ball test for impact resistance. Polariscope test for uniform heat treatment. That's why we call them SUPER-TOUGH*!

Protection's not complete unless sides are considered, too. Style AS, with sideshields, provides all-over eye safety. For frontal protection only, use Style A, without sideshields.

For help on your eye-protection problems, see your Willson Distributor or write to Dept. PQ-11.

*T. M. Reg. U. S. Pat. Off.

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PRODUCTS INCORPORATED

READING, PA., U. S. A. Established 1870

Also makers of world famous Willsonite sunglasses

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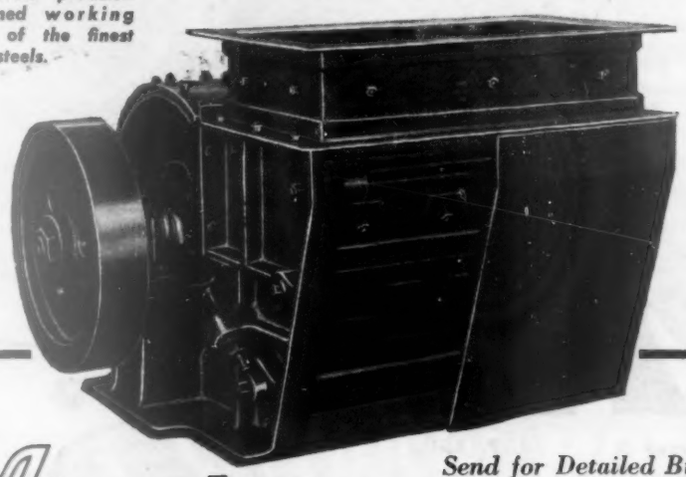
TO GET EXTRAORDINARY TONNAGE FROM AN ORDINARY OPERATION

The "extras" are engineered into the construction. Reinforced, heavy duty construction with precision machined working parts of the finest alloy steels.

American Crushers are known for their capacity to get extra production where only ordinary production existed before. Great range of reduction, greater output and—day-after-day, year-after-year, trouble-free service with low operating cost are made possible by American's exclusive design features.



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American PULVERIZER COMPANY

Originators and Manufacturers of Ring Crushers and Pulverizers

1059 Macklind Ave. St. Louis 10, Mo.

World's Most Versatile Unit

Brooks **LOAD LUGGER** *for Handling Materials*

Enclosed Type Container may be used handling refuse or wet materials.

Here's new speed and efficiency in moving materials on hand loading jobs. Mount a Load Lugger on any standard truck chassis and use 5 to 10 dump buckets. It cuts costs in quarry operations, stripping overburden, road building and scores of hauling jobs. Ask for Catalog.

TrucKrane Boom Attachment may be used for lifting or placing pipe, etc.

107 Davenport Road, Knoxville 8, Tenn.

Distributors in all Principal Cities

Brooks EQUIPMENT AND MFG. CO.

The New York district sales offices of Atlas Powder Company's explosives department have been moved to the Lincoln Building, 60 E. 42nd Street, New York City. During alterations the offices will be located on the 28th floor but later they will occupy the 52nd floor.

"Glad to greet you as a free citizen again after three years out of this world. It's a glorious feeling, and the Army is treating us fine." This was the first direct word Gardner-Denver officials received from Francis R. MacNamara, who was among those liberated February 23 from Los Banos internment camp, south of Manila.

Mr. MacNamara, Gardner-Denver's Manila representative, went to the Philippines in April of 1940. Previously, he had represented the firm at New York City, Scranton, Pottsville and Hazelton, Pennsylvania.

Barber-Greene Company, Aurora, Illinois manufacturers of asphalt equipment and material handling equipment, have announced the appointment of John H. Dykstra as advertising manager.

Mr. Dykstra, formerly with Mumm-Mullay & Nichols, Inc., Columbus, Ohio, advertising agency, succeeds Blain S. Britton, who has resigned.

C. H. Schuettenberg

Announcement of the appointment of Clarence H. Schuettenberg as sales manager of the Chicago stoker division of the Link-Belt Company has been made by F. H. Herndon, manager of the company's stoker division. Mr. Schuettenberg has been associated with this division since 1933.

New district sales appointments have been announced by the following firms:

LaPlant-Choate Manufacturing Company, Cedar Rapids, Iowa: K. V. Turner, district representative, Washington, D. C.; A. C. Cartwright, district representative, Atlanta, Georgia; Milo Davin, district representative, Cedar Rapids; S. I. Harris, district representative, San Leandro, California.

Koehring Company, Milwaukee, Wisconsin: Ray Dorward, distributor for Indiana (except Lake, Porter, LaPorte, Starke, St. Joseph and Marshall counties).

Besser Manufacturing Company, Alpena, Michigan: David Wright, sales representative, Phoenix, Arizona.

Davey Compressor Company, Kent, Ohio: Construction Equipment & Supply Company, Pittsburgh 21, Pennsylvania, distributors for Davey products.

Allis-Chalmers Manufacturing Company, Tractor Division, announces the appointment of Ernest Franks in charge of sales of industrial wheel tractors and power units, with headquarters at Milwaukee, Wisconsin.

From June 11-19 the Wickwire Spencer Steel Company presented at the Hotel Biltmore in New York a public exhibition and auction of 35 Artzybasheff

originals, for the benefit of the 7th war loan drive. The paintings, which had been used in Wickwire Spencer's three-year institutional advertising campaign, portrayed the brutality of the Axis powers and the important role of the steel wire industry in the present conflict.

The Timken Roller Bearing Company, Canton, Ohio, announced the recent appointment of John J. Yezbak as public relations and news bureau manager.

The Sullivan Machinery Company, Michigan City, Indiana, recently announced that the following officers had been elected: J. D. A. Morrow, president; Arthur S. Knoizen, executive vice-president; Frederick W. Copeland (former president), chairman of the board. Mr. Morrow, who is also president of the Joy Manufacturing Company, and Mr. Knoizen, Joy's executive vice-president, will retain their offices with that firm.

The April number of *LaPlant-Choate Topics*, a monthly publication of the LaPlant-Choate Manufacturing Company, Inc., featured on its cover a photograph showing a LaPlant-Choate Pivot-Dozer clearing newly-won ground on Eniwetok for the building of an American airfield.

The Manhattan Rubber Manufacturing Division of Raybestos-Manhattan, Inc., Passaic, New Jersey, has received the National Security Award from the United States Office of Civilian Defense. The company already has earned a three-star Army-Navy "E" and the Treasury "T" flag.

E. F. Schaefer, executive vice-president of the Gardener-Denver Company, stated, in explaining the company's transfer of its export department from Quincy, Illinois, to New York City, that there has been a steadily accelerating interest in Gardner-Denver products in foreign markets. Mr. Schaefer indicated that this was true particularly of Latin-American countries.

B. F. Lease

B. F. Lease was elected to the presidency of the Athey Truss Wheel Company at a meeting of the board of directors in Chicago on April 16. Mr. Lease, who, since July, 1944, has been vice-president in charge of sales, advertising and service, succeeds the late C. Kier Davis, who died in March as the result of injuries received in an automobile accident.

Ray B. Bolton, public relations counsellor for the Associated Equipment Distributors, has assumed the duties of directing public relations and publicity activities for A.E.D. in the executive office in Washington, D. C. He succeeds R. S. Patten, former chairman of the publicity committee, who recently resigned.

The expansion program of Bay City Shovels, Inc., of Bay City, Michigan, has necessitated the building of a third addition to the original plant since Pearl Harbor. The company has announced that the new facilities have increased its output by 30 per cent.

The Highway Equipment Company of Cincinnati, Ohio, has let contracts for the construction of a building, 100 feet by 175 feet, on a five-acre site.

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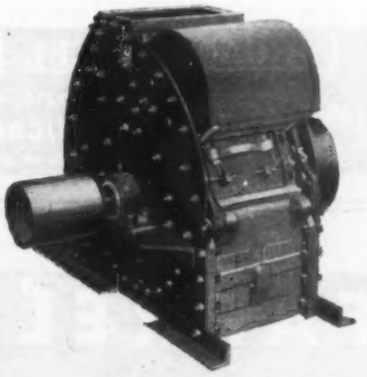

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J. J. Bergen

Commander John J. Bergen, U.S.N.R. (inactive), chairman of the executive committee of Gar Wood Industries, Inc., of Detroit, has been elected chairman of the board of directors. Mr. Bergen, a seasoned member of the Naval Reserve and a graduate of the Naval War College, Newport, Rhode Island, served as chief staff officer at the Naval Air Center at Espiritus Santos, New Hebrides, and later in a similar assignment in Seattle.

The National Supply Company of Pittsburgh, manufacturers of Superior gas and Diesel engines, announced the appointment of Harry A. Olin as credit manager of the Superior engine division. Mr. Olin came to the company from the Office of Industry Advisory Committees of the Office of Price Administration. Previously he had been active in the corporate and municipal banking, investment and credit fields.

According to William J. Reagan, export manager of the Koehring Company, Milwaukee, Wisconsin, who recently returned from Central and South America, the Latn-American republics are planning large-scale construction of roads and highways, airports, low-cost housing and public works. Mr. Reagan reported particularly impressive housing projects and a relocation project in Ecuador and highway and water-power developments in Colombia, as well as municipal improvement plans in several cities.

Upson Walton Company of Cleveland announced that Glenn H. Sheldon had succeeded O. C. Kiehne as president of the firm. Mr. Kiehne will serve as treasurer and will also assume the duties of the executive vice-president, an office formerly held by Mr. Sheldon.

The Hanson Clutch and Machinery Company, Tiffin, Ohio, was recently awarded the Army and Navy "E" flag for its outstanding contribution to the war effort.

Trade Literature

The pieces of literature listed below can be obtained direct from the manufacturers named, or requests can be addressed to Pit and Quarry's "Service to Readers" Department.

AIR PLUS JAEGER COMPRESSOR. 26 pages. Catalog JC-5. The Jaeger Machine Company, Columbus 16, Ohio.

FLEET FOOT JAEGER LOADER, CRANE AND EXCAVATOR. 50 pages. Catalog JL-5. The Jaeger Machine Company, Columbus 16, Ohio.

JAEGER SURE PRIME CONTRACTORS PUMPS. 54 pages. Catalog P45. Jaeger Machine Company, Columbus 16, Ohio.

GARGOYLE ALMO OILS. 12 pages. The Socony-Vacuum Oil Company, Inc., New York.

WATER HOSE. 2 pages. Catalog section 4800, 3-45. The B. F. Goodrich Company, Akron, Ohio.

THE BRISTOL COMPANY. 9 pages. Bulletin W1804. The Bristol Company, Waterbury 91, Connecticut.

HALL-SCOTT "400". 17 pages. Hall-Scott Motor Car Company, Berkeley 2, California.

MANGANESE STEEL DIPPERS. 12 pages. 114B. Electric Steel Foundry, Portland 10, Oregon.

MR-45. 52 pages. Catalog. Describes line of self-contained motorized speed reducing units. Philadelphia Gear Works, Philadelphia, Pennsylvania.

HANSON GOOSE NECK TRAILERS. 4 pages. The Hanson Clutch & Machinery Company, Tiffin, Ohio.

HANSON GOOSE NECK HEAVY DUTY TRAILERS. 8 pages. The Hanson Clutch & Machinery Company, Tiffin, Ohio.

HANSON GOOSE NECK HEAVY DUTY MACHINERY TRAILERS. 8 pages. The Hanson Clutch & Machinery Company, Tiffin, Ohio.

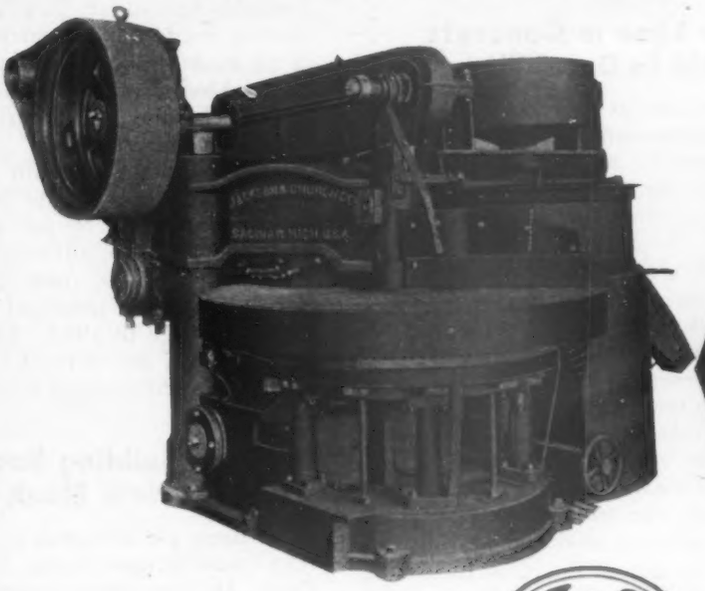
SYMONS VIBRATING BAR GRIZZLY. 4 pages. Bulletin 121. Nordberg Manufacturing Company, Milwaukee, Wis.

July, 1945

The CONCRETE MANUFACTURER

A Special Section of ....

The "ONE-TWO" PUNCH! . . . J & C MACHINES "K.O." Concrete Brick Production Problems



J&C CONCRETE BRICK MACHINE . . . is a high-speed unit, making 28,000 perfectly moulded bricks in one 8-hour shift. No pallets needed, eliminating time lost in handling and storing. Flat deck platform insures lower first cost.

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J&C HIGH PRESSURE STEAM KILN . . . is the standard modern method for curing concrete bricks. This J&C unit provides 24-hour delivery of fully-aged, shrink-proof products from moulding machine to construction job.

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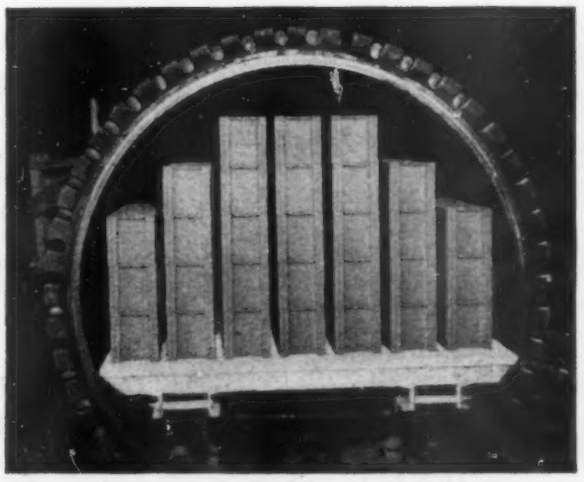

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The CONCRETE MANUFACTURER

JULY, 1945

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Warner Co. Reports Big Pour Record At Philadelphia

The Philadelphia retail department of the Warner Company set a new record on April 6 when it delivered 2,245 cubic yards of concrete to the Gulf Oil Corporation in 11 hours. The order, delivered to Gulf Oil's fluid catalyst plant at Girard Point, was the largest concrete pour for a single customer in the history of the company.

View Lime in Concrete As Aid to Durability

Contrary to previously held opinions among concrete producers, there is a growing tendency on their part to view the inclusion of lime in concrete as conducive to greater durability. According to *Limeographs,* "lime . . . acts to entrain air in the concrete. . . . Lime, being extremely finely divided, also serves as a plasticizing agent and acts to increase the cohesiveness of the matrix . . ."

In describing tests on concrete cores taken from highways, *Limeographs* states that small bubbles were somewhat more numerous in concrete containing lime, but that these were rounded and well distributed throughout the mass, furnishing evidence of air entrainment. Judging from experience, continues the article, the durability of highways constructed of part-lime concrete equals or surpasses those containing no lime.

Insulcrete Sells Out To Illinois Brick Co.

The Chicago Insulcrete Company of Franklin Park, Illinois, manufacturers of lightweight concrete blocks, have announced the sale of their land, buildings, equipment and business to the Illinois Brick Company, 228 North LaSalle Street, Chicago.

Coastal Tankers Ordered From Concrete Pipe Co.

United Concrete Pipe Company of Long Beach, California, was recently awarded a contract for six 230-foot coastal tankers for the Maritime Commission at a price of $588,299 each. United previously has built vessels for the War Department.

Canada's 1943 Products Output Hits $5,000,000

A report of the concrete products industry in Canada for 1943 has been released by the Mining, Metallurgical & Chemical Branch of the Department of Trade and Commerce. The 140 plants operating in the Dominion produced concrete products valued at $5,639,260, including ready-mixed concrete, pipe of all kinds, hollow building blocks, cinder blocks, artificial stone, Haydite blocks and slabs, burial vaults and other items.

Thirteen tables contain information on such items as the following: principal statistics, by provinces, for 1942 and 1943; capital employed, by provinces; material used in the industry output of principal concrete products, 1928 to 1943. The report also carries a directory of Canadian concrete manufacturing firms.

Mexican Building Boom Calls for New Block Plant

To meet the demands of the current construction boom in Agua Prieta, Mexico, a new concrete building block manufacturing plant has been established there by José F. Aragon. Blocks 8 by 8 by 16 inches and 6 by 8 by 12 inches will be made by machinery recently installed. Materials for the various products will be imported from the United States.

Portland Cement Assn. Features Culvert Uses

A descriptive leaflet published recently by the Portland Cement Association featured the utilization of concrete pipe culverts for overflow structures and improved drainage and for replacing worn-out bridges. Illustrations show typical uses of the culverts. A table of the hydraulic capacity of concrete pipe lines also appears in the pamphlet.

A Good Buy - *Bonds*

Ready-Mix Firm Expands Facilities To Produce Concrete Masonry Units

General view of block storage yard and plant with aggregate conveyors, Greenville Concrete Company, Greenville, South Carolina.

another ON THE SPOT report

EVEN before Pearl Harbor there was evidence of a trend among firms in the concrete business to widen and diversify their products and services. The war years have served to emphasize the soundness of this practice from an economic point of view, and despite equipment and manpower shortages many concerns have succeeded in expanding their facilities in order to manufacture products that were not anticipated at all when the original plant layouts were made. In recent months we have visited a number of producers who feel that the outstandingly successful concrete products concern of the future may well be a kind of "concrete department store," supplying every conceivable product and service which involves concrete.

At present the trend is most clearly manifested by the number of ready-mixed-concrete plants that have installed machinery for manufacturing concrete blocks, and *vice versa*. Although masonry units and poured concrete are to some extent competitive products, they are quite commonly used on the same construction jobs, and builders are quick to avail themselves of the opportunity of purchasing both materials from a single supplier.

The Greenville Concrete Company of Greenville, South Carolina, provides an interesting example of this trend toward diversification. After 10 years of producing only ready-mixed concrete, this company in August of last year installed a modern and efficient block plant utilizing, of course, some of the

By WILLIAM M. AVERY

equipment and many of the facilities of the ready-mixed plant. This installation might be regarded as an endorsement of the principle of combined operations, for the same development was undertaken several years ago at an older plant operated by this company at Spartanburg, South Carolina.

In violation of an odd aversion of block manufacturers toward the use of their own product, the Greenville block plant was built entirely of concrete masonry units. The upper portion of the 3-level structure houses two 50-ton aggregate bins. Bagged cement, which is loaded in by means of a chute from the railway siding to the block building, is stored on the second floor-level in a room adjacent to the Stearns 28-cubic foot mixer. The proportioning is done in volume batching boxes located above the mixer, which discharges by gravity into a hopper feeding the Stearns Number 7 Joltcrete at yard level.

About 3,000 8- by 8- by 16-inch equivalents are produced at this plant in a 10-hour day. The four 9- by 42-foot concrete-masonry curing rooms are equipped with hinged timber doors at each end so that loading out into the storage yard does not interfere with the loading in operation. Barrett - Cravens jack - lift trucks are used for moving the wood racks from the block machine to the curing rooms, where low - pressure steam is used for at least 8 hours. The four rooms have a total capacity of 2,800 units, and up to 120,000 blocks can be accommodated in the storage yard.

The company uses Atlas Duraplastic cement in both its block and ready-mix operations, and strength tests of its masonry output usually range between 1,200 and 1,800

General view of block storage yard and plant with aggregate conveyors, Greenville Concrete

View of block plant building, showing overhead conveyor.

Side view of block machine showing feed hopper overhead.

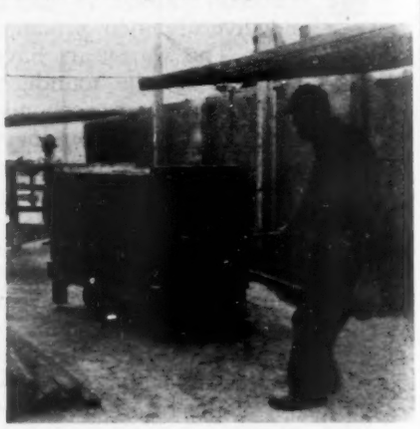
pounds per square inch. The aggregates used in the block plant consist of equal parts of coarse sand and crushed limestone, the latter supplied by the Campbell Limestone Company at Liberty, South Carolina.

The three-compartment concrete storage bins from which stone is drawn for both the ready-mix and block plant operations are close to and parallel the plant railway siding, the latter being located some 20 feet above yard level. Stone is unloaded from an under-track hopper into the storage bins by means of a 24-inch by 40-foot Barber-Greene portable conveyor. Stone is drawn through manually operated gates onto a 24-inch by 80-foot belt conveyor which extends the full length of the concrete tunnel under the bins. A 24-inch by 120-foot inclined conveyor rises from the end of the tunnel to the top of the Butler batching plant, where a selector chute—which can be adjusted from the ground—makes it possible to discharge into any one of the 3 aggregate compartments or onto a short 24-inch belt conveyor which discharges into the block plant bins.

Cement for the ready-mix operations is handled in bulk; an overhead screw conveyor feeds from an under-track hopper and discharges directly into the 300-barrel compartment of the batching plant bin. The mate-

(*Continued on page* 183)

L. to r., Mrs. Miriam Goldsmith, J. B. (Jake) Harley, and Miss Evelyn Mauney.



A jack-lift truck moves loaded racks to the curing room.

Portable conveyor loads stone from cars into storage bins.

Concrete Masonry Mfrs. Assn. of So. Cal. Holds First Meeting

another ON THE SPOT report

AN association of concrete-products manufacturers has just been organized in Los Angeles, the first formal meeting of the group having been a dinner at the Hotel Mayfair on the evening of June 7.

The new organization is to be known as the Concrete Masonry Manufacturers' Association of Southern California. Its officers are: president, E. P. Ripley (General Concrete Products Company, Van Nuys); vice-president, J. A. Allen (Hollostone Company, North Hollywood) secretary-treasurer, Jack Vollmer (Vollmer Concrete Products Company, Colton).

One of the chief aims of the new association will be to conduct an educational campaign among contractors, engineers, architects, and lending institutions stressing the superiority of concrete-masonry construction over other types.

It is pointed out that productive capacity has increased fifteen-fold in the Los Angeles area alone in the last three years and that a broadened market for the industry in southern California is an economic necessity if producers are to continue to prosper during the post-war years.

As its first constructive step the new organization, in co-operation with the Los Angeles district office of the Portland Cement Association, is carrying on a series of exhaustive tests in the yard of the Monolith Portland Cement Company in the lower San Fernando Valley. These tests, under the supervision of Samuel Hobbs, P.C.A. engineer, are believed to be among the first ever carried out on wall sections of *reinforced*-concrete masonry.

A close-up view of some of the test panels.

To determine the data desired for incorporation in building codes, the Los Angeles city and county building departments and the Pacific Coast Building Officials' Conference were first consulted. Thirty 6- by 9-foot test panels were laid up, using concrete units supplied by representative manufacturers. Both ordinary Portland and plastic cements were used in making the units under test. Some of the wall sections are 6 inches and some 8 inches in thickness. Vertical ½-inch steel reinforcing spaced 2, 3, and 6 feet apart is employed in representative panels and all are being tested for both flexure and shear.

The Mason Contractors' Association of Los Angeles supplied the labor and skilled workers to lay up the test panels. The Monolith Portland Cement Company contributed the cement, and the Consolidated Rock Products Company the sand. A prominent steel distributor furnished the reinforcing rods.

The 6- by 9-foot panels were built of concrete units supplied by representative manufacturers.

Parked Ready-Mix Truck Figures in $25,000 Suit

The trial of a $25,000 negligence suit, instituted by Lester Brey against Joseph Rosenfeld of the Rosenfeld Washed Sand & Stone Company, opened recently at Woonsocket, Rhode Island. The plaintiff seeks this sum in compensation for the accidental death of his son, aged 8, who was killed by a passing car when he detoured around a Rosenfeld truck parked for delivering a load of ready-mixed concrete. The court requested the defense to locate the chief witness, a seaman in the United States Navy, driver of the truck, said to be in South Carolina.

The defense argued that the victim was not near the truck at the time of the accident, to which the plaintiff's attorney replied that the vehicle had been parked at an angle which blocked the sidewalk and necessitated walking around it in the street.

Pit and Quarry Reaches Block Producer in Pacific

A communication from Pfc. Joseph P. Belick, owner of a concrete block factory and a crushed stone quarry at Northampton, Pennsylvania, states that he has recently been transferred from his former station at a B-29 base in India to another base "somewhere in the Pacific." He reports that he is receiving his copies of PIT AND QUARRY, which he passes on to other concrete block manufacturers after careful reading.

Because the Office of Defense Transportation has not rescinded its order banning conventions, it has been decided to cancel plans for the 1945 annual meeting of the National Concrete Masonry Association.

Listed as sold to A. V. and Mrs. A. V. Kunkel of Quincy, Illinois, was the property owned by the E. B. Gibson Company, manufacturers of concrete blocks in that city.

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Issue Patent on Concrete Drydock

To Charles A. D. Bayley, Montclair, New Jersey, the United States Patent Office has issued a patent for his proposed floating drydock, to be constructed of reinforced concrete.

As described in Mr. Bayley's specifications, the dock is constructed of cylindrical caissons of reinforced concrete, preferably formed by the centrifugal casting process. At least one row of these, laid crosswise and fastened with heavy longitudinal concrete beams, forms the floor. Similar caissons, set on end, compose the side walls and supply additional buoyancy.

New England Group Elects New Officers

The following new officers were announced by New England Concrete Masonry Manufacturers, Inc.: Geno Commassi, Shrewsbury Concrete Block Company, Auburn, Massachusetts, president; Philip Paolella, Plasticrete Corporation, Hamden, Connecticut, vice-president; Walter M. Burse, Boston, secretary - treasurer.

Freitas Acquires Plant In Projected Expansion

Transfer of the Healdsburg Concrete Pipe Company of Ukiah, California, to John Freitas was announced recently. Mr. Freitas, owner of the Ukiah Gravel & Cement Company, purchased the plant to supplement his business, which he plans to expand.

New Oklahoma Concern Opens at Blackwell

A new industry, the Mid - West Concrete & Supply Company, began operations at Blackwell, Oklahoma, in April. The firm is the only one of its kind in two adjacent counties, and delivers ready-mixed concrete to users within a considerable radius of Blackwell.

A Norfolk, Virginia, circuit court jury has rendered a verdict which awards $6,500 to Donald F. Williams in his damage suit against the Transit Mixed Concrete Corporation for injuries he received in a collision of a navy bus and one of the company's concrete trucks.

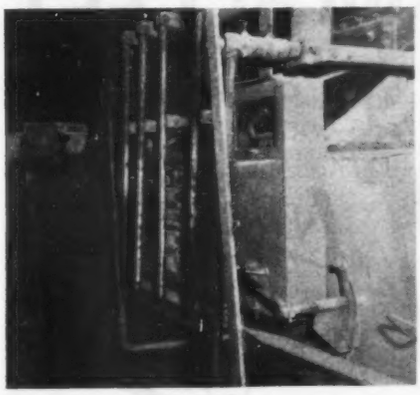
Modahl & Scott, concrete contractors of Bloomington, Illinois, has announced the opening of a new mixing plant there.

Ready-Mix (*from page 180*)

rials are weighed by means of a Butler 5-beam scale and water is measured through a Neptune meter.

The company operates 5 Smith and 2 Rex mixers mounted on Ford, Chevrolet and G.M.C. trucks. Deliveries are made within a 30-mile radius, although every effort is made to stay well within this limit in order to conserve tires and gasoline. Concrete is sold on either a strength or a specification basis. Although the plant could probably turn out as much as 300 cubic yards in a day, up to the present time, the maximum pour for one day has not exceeded 125 cubic yards. About 25 men are employed in the combined operations and the plants normally work a 10-hour day. Pennell and Harley, Inc., are owners of the Greenville and Spartanburg plants, and the Greenville operations are under the direction of James B. Harley.

After proportioning in the volume box, material is discharged into mixer.



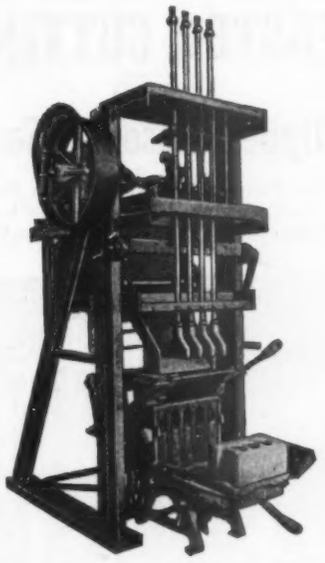
Five-beam scale on batcher in ready-mixed-concrete plant.

One of the seven truck-mounted mixers under the batching plant.

Concrete Fireplaces Shown in New Booklet

Concrete Information, a publication of the Portland Cement Association (Housing & Cement Products Bureau), presents attractive sketches and photographs of outdoor fireplaces built of concrete masonry. The four-page bulletin also contains plans and sketches of various kinds of outdoor stoves and grills. Several types of construction are discussed, and suggestions are given for obtaining best results.

Edward J. Schantz, proprietor of the Hartford City Concrete Products Company, Hartford City, Indiana, died recently at Indianapolis after a brief illness.

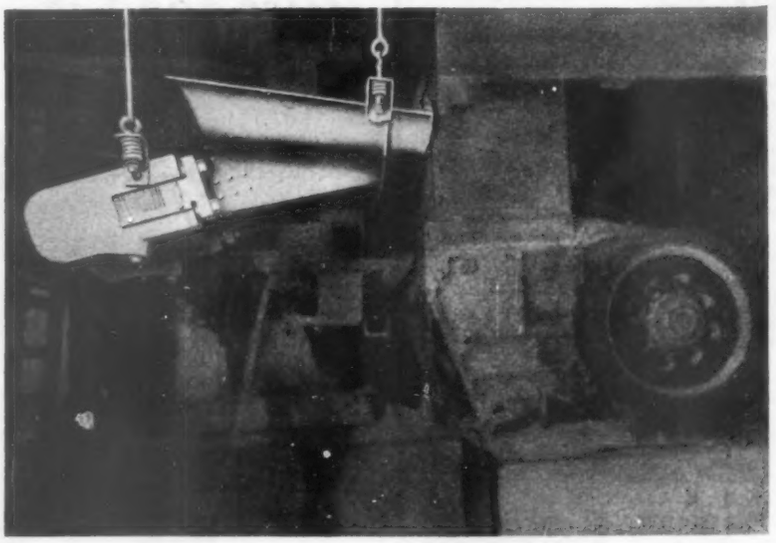


Recognized Everywhere

The Hobbs Jr. Face-Down Block Machine is recognized everywhere as the great general purpose machine of the concrete-products industry. Famous for its wide range of sizes and the variety of blocks it can produce. As illustrated, it is equipped with striking and finishing device, shown under the floor-type tamper and with power feeder.

Hobbs block machines, Anchor tampers, Anchor Jr. strippers, Stearns power strippers and Jolt-crete, Stearns mixers, and Cast Iron and Press Steel pallets, Straublox oscillating attachments, etc. Repair parts for: Anchor, Ideal, Universal, Stearns, Blystone mixers and many others.

ANCHOR CONCRETE MACHINERY CO.
1191 Fairview Ave. Columbus, Ohio



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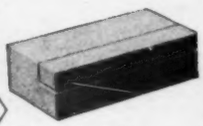
Your Special Size and Shape Brick or Concrete Block can now be "Tailor Made" at a moment's notice!

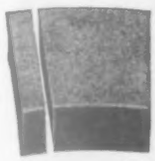
The new Clipper Multiple Cutting Principle makes possible faster cutting of every masonry material regardless of hardness.

Here are a few typical examples of the speed and accuracy with which concrete products and fire brick can be cut.

This concrete block, converted into a special size, was cut completely in two in 19 seconds.

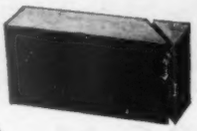
One of the many intricate cuts performed on first quality clay brick for heat treating furnaces —made in 8 sec.





Rotary Kiln Blocks, cut to size for "key" bricks in rotary kilns, require only 10 sec. for completion of cut.

Basic refractories for steel furnaces or cement kilns must be accurately installed. This magnisite brick was cut in 12 seconds!



Clipper Saws are available for trial. Write for Descriptive Catalogs.

THE Clipper "CUTS RIGHT THRU" MANUFACTURING COMPANY

4029 MANCHESTER
ST. LOUIS, MISSOURI

NEW MACHINERY and SUPPLIES

● Improved Truck Mixer

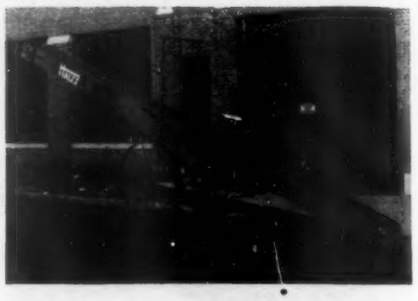
New operating advantages are pointed out by the Jaeger Machine Company, Columbus, Ohio, for their 1945 line of Hi-Dump truck mixers. Among new features especially mentioned are improvements in transmission, drum mounting and charging hoppers, the elimination of overhead water tanks and complete enclosure of the front end. Permanent alignment between transmission and drum has been provided by mounting the drive pinion and front drum trunnion bearing on the same support.

One enclosure houses engine, transmission and water system.

To increase charging and discharging speed, the drum opening has been enlarged and the charging hopper equipped with a large discharge gate which opens with a half-turn of a control wheel. Heavy-pressure metal seals have been replaced by inexpensive light-pressure synthetic rubber rings, said to require less frequent replacement and capable of being changed in 30 minutes without the removal of the hopper.

● Cargo Conveyor

George Haiss Manufacturing Company, Incorporated, New York, have brought out a new portable conveyor—the Junior Cargo. It has been designed for the handling of smaller and lighter articles, such as concrete and terra-cotta blocks, bricks, etc. The rollers which support the belts are of the ball-bearing type closely spaced. Either gasoline engine or electric drive can be furnished. Available in belt widths of 16, 20 and 24 inches, and in lengths from 20 to 40 feet.



Portable conveyor designed for handling concrete blocks.

Just feed it . . . the APPLEY
"LITTLE GIANT"
Concrete Block Machine

Vibrating Action
Rugged Construction
Versatile Production

Price $995.00
F.O.B. Factory

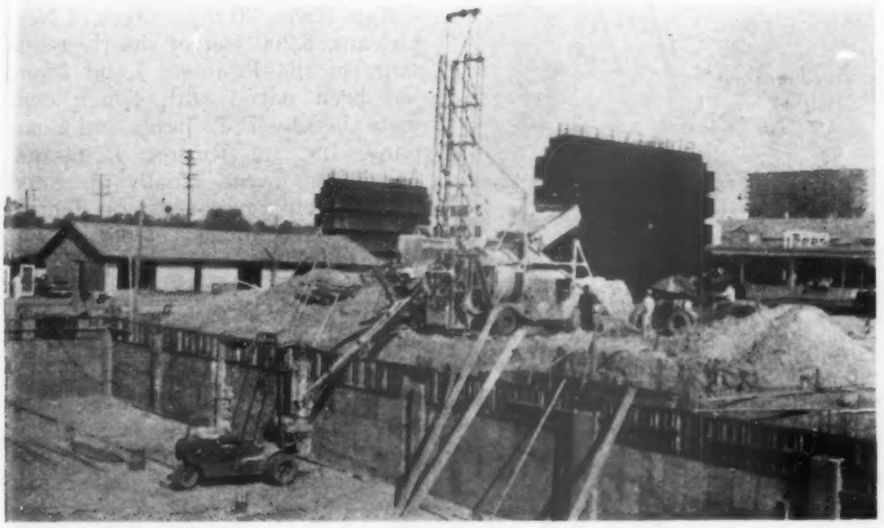
and reap top-notch quality and profits

NO MORE SLOW AND FAULTY HAND TAMPING . . . *now* the small block operator can meet competition successfully with the APPLEY Little Giant. This is a low-priced, vibrating machine that moulds perfectly cut blocks of maximum strength and density.

The Little Giant is simply designed and durably built for continuous, economical production at speeds up to 120 8" x 8" x 16" blocks per hour. Interchangeable cores and partition plates for supplying all standard sizes. Write for Bulletin.

J. W. APPLEY & SON, INC., 831 Ninth St., No. St. Petersburg 4, Fla.

Ready-Mix Firm Effects Savings By Utilizing Modern Equipment



General view of batching, mixing and pouring operations of Stover and Stover on the Ontario, California, job.

another ON THE SPOT report

THE utilization of modern equipment for the batching, mixing, elevating, and pouring of concrete is saving thousands of dollars for the Los Angeles contracting firm of Stover & Stover this spring on a construction project at Ontario, California.

The job, a building to house the new citrus by-products plant of the California Fruit Growers' Association, involves the mixing and placing of about 6,000 cubic yards of concrete. By using a Mixermobile, Buggymobile and a couple of Scoopmobiles it has been unnecessary to erect a batching plant and elevator at the site, no motor trucks are needed on the job, and the waiting time of aggregate-delivery trucks has been eliminated.

Aggregates are dumped in piles convenient to the Mixermobile which prepares the concrete. A Scoopmobile, its bucket holding exactly 20 cubic feet, struck measure, batches the aggregates by volume from the storage piles to the skip of the Mixermobile. Cement is added from sacks at the skip. After mixing, the concrete is discharged from the drum *via* a chute to the Buggymobile for quick dispatch to the floor and footing forms. For pouring the 12-foot wall shown in the illustrations, a flexible, economical method was devised. This consisted of installing a ¾-cubic-yard concrete hopper on a Scoopmobile chassis, replacing the conventional scoop, and the lift was likewise increased to 18 feet by the addition of 6 feet of hoist framework and back-stays. As

Mobile scoop delivering measured quantity of aggregates to mixer-charging skip.

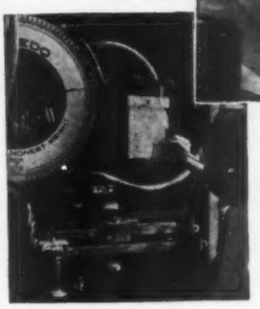
For Improvement in

Quality • Sales • Profits

Install [SC]² PRECISION CONCRETE CONTROL It Includes

Moisture Meter

Makes a test for moisture content of sand or stone in ONE minute. Accurate to ¼%.



Compensator

Delivers correct DRY weight of aggregates and ADDED water. Makes a graph record of EVERY BATCH.

[SC]² CONTROL produces *uniform concrete*. Is always approved by concrete engineers. Has definite sales value. Write for our booklet "Profits in Concrete."

SCIENTIFIC CONCRETE SERVICE CORP.
McLachlen Bldg., Washington, D. C.

FREE

PEEP SHOW !

DISCLOSING IN THEIR MOST INTIMATE DETAILS

Views and descriptions of Butler Materials and Handling.

Equipment — equipment which,—because of Butler Engineered Design,— will be your ally, in meeting the high production demands of the post-war years.

Write and ask for Bulletin 185

BUTLER BIN CO.
WAUKESHA WIS.

More cored steel pallets used in 1941 than ever before. Block makers increased and bought the best equipment possible, knowing that cored steel pallets were without the faults of other types.

The Cold Pressed, Heavy Gauge Commercial Pallet is the equipment that lasts, easiest to handle, and free from breakage.

Our Pallet Catalog and Booklet "Here's the Dope" should be in all block makers' hands. Write for them.

THE COMMERCIAL SHEARING AND STAMPING CO.
YOUNGSTOWN, OHIO

Mobile concrete-hopper with load elevated and ready for trip to 12-foot wall forms in background.

soon as the hopper is filled with concrete at the Mixermobile, the converted unit quickly carries the material to the wall forms, where it is deposited at the proper height directly into the inclosure.

The concrete operations were carried out for the contractor by the Coöperative Building Materials Company of Los Angeles. Aggregates were supplied and delivered by the Consolidated Rock Products Company, also of Los Angeles.

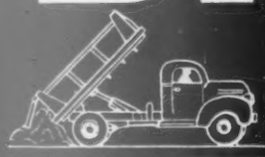
Old Man River Gets Paving Job On Louisiana Levee

Along the east bank of the Mississippi River, 30 miles north of New Orleans, 6,200 feet of the river-side slope of the Promised Land levee, has been paved with 4-inch concrete slabs by T. L. James and Company, Inc., of Ruston, Louisiana. Mississippi levees, usually protected by wooden revetments or fences, have been in danger of erosion because of the wartime scarcity of wood. The United States Engineer Office at New Orleans, therefore, awarded to the James company and many others contracts for paving certain sections with concrete.

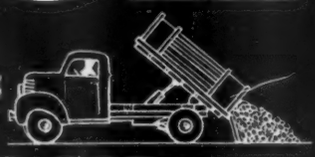
Benefits which will be realized from the work include protection from erosion, resistance to fire (always a danger to wooden installations) and prevention of theft.

Garnett Burgess, president and owner of the Cinder Block Company, Richmond, Virginia, died in that city on June 18. Mr. Burgess founded the company in 1921.

DAYBROOK

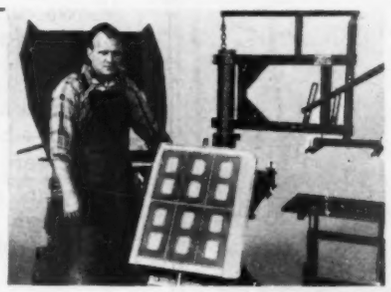


HYDRAULIC HOISTS —
STEEL DUMP BODIES
All Sizes — Any Capacity



THE DAYBROOK HYDRAULIC CORP.
BOWLING GREEN, OHIO

IMPROVED FLAM
"Challenger"
BLOCK MACHINE



Filled 6-unit mold being turned over without pallet.

A "Challenger" Concrete Vibrating Machine requires only a very small investment, yet it equals the performance of expensive, complicated machines. Its extreme simplicity of operation has amazed thousands after seeing how easily and rapidly high-quality concrete blocks, brick and tile can be made. Decide now to modernize your plant with a Flam "Challenger." Meet the growing demand for modern materials and make more profits for yourself. Get all the facts TODAY!

STEPHEN FLAM 15025 OXNARD ST. VAN NUYS, CALIF.

CONCRETE BURIAL VAULTS
America's Finest Molds and Lowering Device

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1620 LUCAS HUNT RD.
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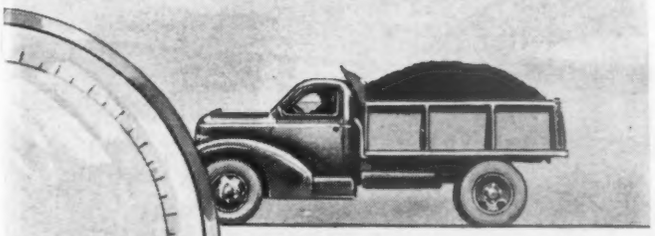
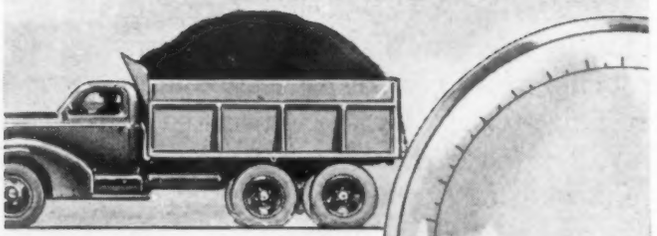
Same Driver...Same Truck....



13,000 lbs.

4 TONS PAYLOAD



8 TONS PAYLOAD

26,000 lbs.

100% more payload!*

A THORNTON Four-Rear-Wheel DRIVE installed on your present 1½-2 ton truck will increase its hauling ability 100% . . . give it 8 ton payload capacity in contrast to its normal 4. With a Thornton conversion, one driver can handle the payloads of two medium trucks. Special axles permit still bigger payloads. You, therefore, double your trucking volume without necessity for hiring another driver or buying another truck.

And that's not all a THORNTON Four-Rear-Wheel DRIVE does for you. Its two-speed gear case and two driving axles, working in combination with the standard truck transmission, enables you to pull 26,000 pounds G.V.W. up grades as steep as 50%. Its 8 to 16 speeds forward, depending upon the axle type, give you power for every operating condition—let you haul 8 tons payload through mud, muck, deep sand or snow, out of steeply inclined gravel pits or quarries—every place, in fact, where the conventional single axle truck would be hopelessly stalled. And with all this power, a THORNTON Four-Rear-Wheel DRIVE lets you roll on the highway at 40-50 miles per hour, to maintain important delivery schedules.

The THORNTON Four-Rear-Wheel DRIVE is available *without priority or ration release.* COMES COMPLETE WITH 8 NEW TIRES. **Mail the coupon today for full descriptive data and performance details.**

* **IDEAL FOR: Logging • Mining • Lumbering • Oil Production • Limestone Spreading • Sand and Gravel Hauling • Dump Truck Work • General Hauling • Road Maintenance • Street Flushing • Gas and Oil Transport • Ready Mix Concrete • Coal Hauling • Bulk Milk Hauling**

The ODT, recognizing the importance of the THORNTON *Four-Rear-Wheel* DRIVE, allots 8 new tires with each Thornton unit. You get them for your truck when the unit is installed.

QUICK FACTS!

Carries 100% more payload.

Out-pulls, outlasts, out-maneuvers standard trucks costing double or more.

Two-speed gear case increases tractive effort or rim-pull more than 100% over standard truck.

Owners report saving up to 40% on investment . . . 30% on operating costs . . . 35% on upkeep expense.

Provides better flexibility and load flotation.

Six wheel brakes assure greater driving safety.

Saves on tires . . . gasoline . . . oil . . . wages and time.

The heart of the THORNTON DRIVE is the exclusive THORNTON Automatic-Locking DIFFERENTIAL which gives both axles POSITIVE DRIVE and DIFFERENTIAL ACTION without "axle fight." Available as replacement in many standard trucks. Write for details.

FREE: *Mail the coupon for descriptive folders and full details about the* **Thornton** *Four-Rear-Wheel* **Drive.**

EVERY

THORNTON 4-Rear-Wheel DRIVE

INCORPORATES A

THORNTON Locking DIFFERENTIAL

ALSO AVAILABLE FOR TRUCK AXLES

Thornton Tandem Co.

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Please send me catalog of facts on changing my 1½-2 ton truck into a heavy duty truck.

Name _____

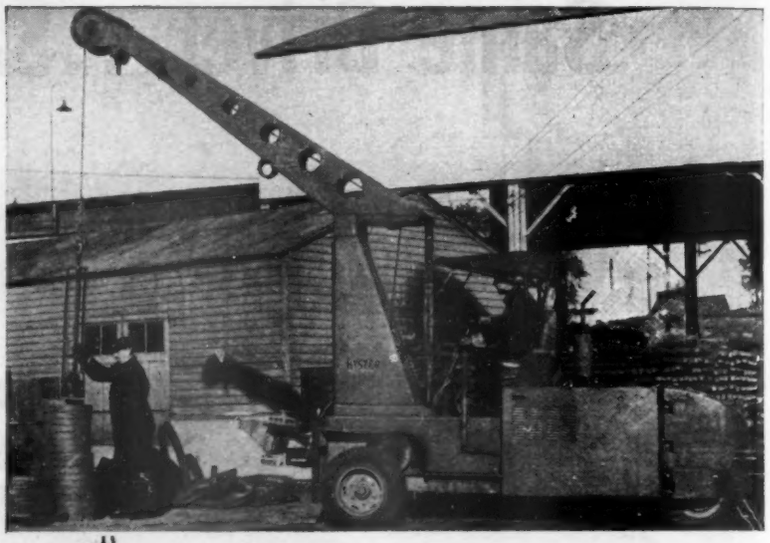
Address _____

City _____ **State** _____

Make of Truck _____ **Year** _____

Used for _____

Goes ANYWHERE - - - handles ANYTHING up to 10,000 pounds



And the HYSTER Karry Krane is easy to operate. Just one lever controls lifting and lowering. Loads may be hoisted or lowered while traveling. Trunnion steering makes maneuvering fast and easy. Pneumatic tires give traction anywhere. Five-position, quickly-adjustable boom provides for "difficult" reaches. For detailed information about this modern, general utility crane, write for catalog 693.

645-56

Pioneer manufacturers of mobile materials handling machines:— fork lift trucks, crane trucks and straddle trucks. All gasoline powered; all pneumatic tire mounted.

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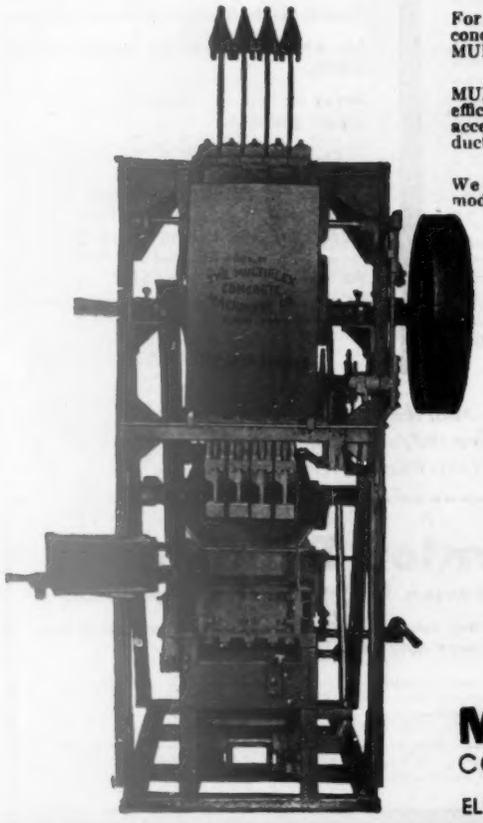
WORLD'S LARGEST MANUFACTURER OF TRACTOR HOISTS AND WINCHES

BRANCH OFFICES . . . 221 N. LaSalle St., Chicago 1, Ill.; 90 West St., New York 6, N. Y.; 1022 Denrike Bldg., Washington 5, D. C.; 233 Ninth St., San Francisco 3, Calif.; Masonic Bldg., New Orleans 12, La.; 2219 Fourth Ave., Seattle 1, Wash.; 2700 Santa Fe Ave., Los Angeles 11, Calif.; 215 Euclid Ave., Cleveland 14, Ohio; 211 Farnsworth Building, Memphis 3, Tenn.

MULTIPLEX Machines For Postwar Profits



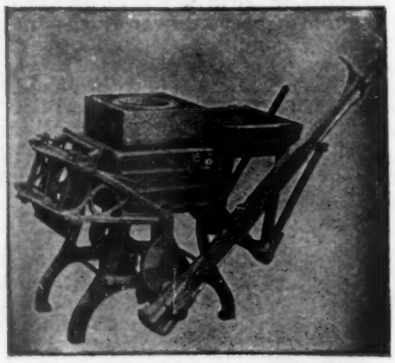
For a Quick "Take-Off" and sustained pace in concrete block output, reserve one of the MULTIPLEX *high-speed* machines.

MULTIPLEX offers a wide variety of super-efficient mixing equipment, with all types of accessories necessary for economical mass production.

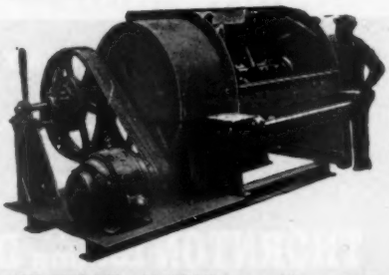
We can recommend MULTIPLEX units for modernizing *your* plant and enlarging its capacity.

Our universal type MULTIPLEX Standard Tamper for making plain and stripper, or face blocks, on one base. Easily convertible as business expands. Supplied with 4-bar or 8-bar tamper, either power or hand operated.

Write for Booklet describing the MULTIPLEX complete line of concrete mixing equipment, including Double and Single Hand Press Strippers, Power Press Strippers, and Super-Tampers.



The MULTIPLEX Flue Block Machine makes ventilated, solid or lightweight units, including all attachments for ventilator and stove pipe openings.



MULTIPLEX Multi-Mixer with reverse screw-type action insures fast and thorough mixing of every batch. Side, end or bottom discharge.

MULTIPLEX
CONCRETE MACHINERY CO.
Frank Muenzer, President
ELMORE • OHIO

REFINEMENT in FEED

GIVES

ACCURATE MEASUREMENTS

of cement and aggregates by agitators in material hoppers plus thoroughness of mixing insure perfect concrete blocks.

KENT

Continuous Mixer

KENT Two Hopper No. 2½ Mixer. Capacity, 8 cubic yards per hour.

Write for Bulletin

The KENT Mixer is an automatically operating precision machine that supplies a continuous stream of perfectly processed concrete. Just keep the hoppers full, and this unit will set a new production record and profit pace for your block machines. Requires no attention. Durably built for years of low cost service. Several sizes.

The KENT MACHINE CO., Cuyahoga Falls, Ohio

The "Quinn Standard"

FOR CONCRETE PIPE

The Quinn Standard is known as the best the world over, wherever concrete pipe is produced and used. Backed by over 30 years' service in the hands of hundreds of Quinn-educated contractors, municipal departments and pipe manufacturers who know from experience that Quinn pipe forms and Quinn mixing formulas combine to produce the finest concrete pipe at lowest cost.

Quinn Heavy Duty Pipe Forms

For making pipe by hand methods by either the wet or semi-dry processes. Built to give more years of service—sizes for any diameter pipe from 12 to 84 inches—tongue and groove or bell-end pipe at lowest cost.

WRITE TODAY

Complete information, prices and estimates sent on request. Also manufacturers of Quinn Concrete Pipe Machines.

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STERLING BABBITT

For Crusher Bearings

Bronze Inner and Outer Eccentric Bushings

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THOS. F. SEITZINGER'S SONS

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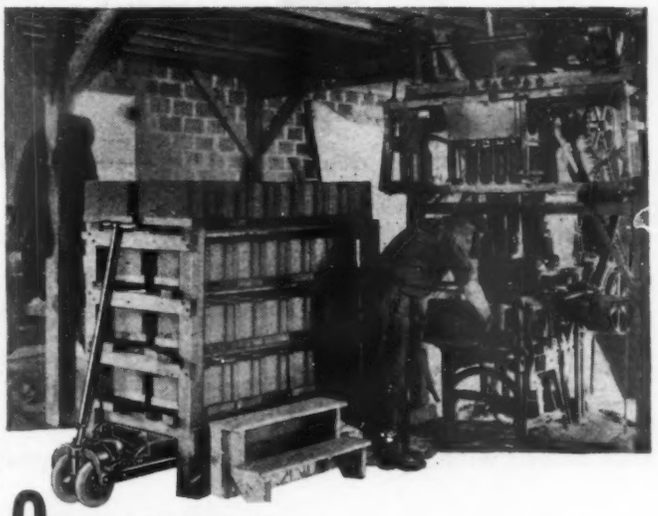
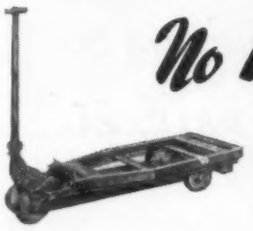


ONE MAN HANDLES 48 BLOCKS . . .

No Breakage!



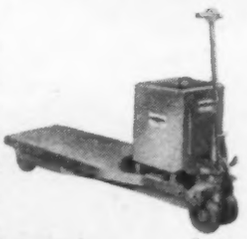
Yes, *one man* with a Barrett Lift-truck handles 48 of these standard concrete blocks 8″ x 8″ x 16″ (or 32 of the 8″ x 12″ x 16″ size). Holding the Lift-truck handle in any position, he raises the load with a single downward sweep. For lowering, he steps on the release pedal . . . and the load settles gently to the floor under control of a hydraulic check.

Barrett Lift-trucks Cushion the Ride

Blocks are moved from machine to curing room and through storage without breakage, protected from jolts and jars by super spring frame and rubber tires. Other features include Hyatt bearings . . . Zerk lubrication . . . and four-wheel construction. The initial cost is low—maintenance, almost nil. Ask a Barrett engineer for a demonstration of Lift-truck performance, or write for illustrated circular.

and for electric drive . . .

THE POWEROX!



Cuts handling time and effort to an absolute minimum. Hand lift—electric drive. Loads are raised with a few short strokes of truck handle. Forward and reverse motion of truck is electric, controlled by push buttons. Automatic brake, dual motors, rear wheel drive. PowerOx provides real economy without a large investment. Write for details today!

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Barrett Handling Equipment

BARRETT

ONE MAN DOES MORE THAN 3 OR 4 . . . WITH A BARRETT

ERIE OFFERS the most complete line of digging and rehandling buckets offered by any single manufacturer ★ Uncle Sam liked our bucket designs and ordered thousands for special digging jobs on all fronts ★ It will pay you to get an Erie Bucket for it will be made to fit your crane, material and cycle of operation ★ We have proved scores of times that an Erie bucket designed for the job will pay for itself in a predetermined period and then pay off in steady profit ★ Whatever you handle you can do it faster and easier with an Erie ★ Erie builds 10 types of buckets but sells predetermined bucket performance that must pay for the bucket ★

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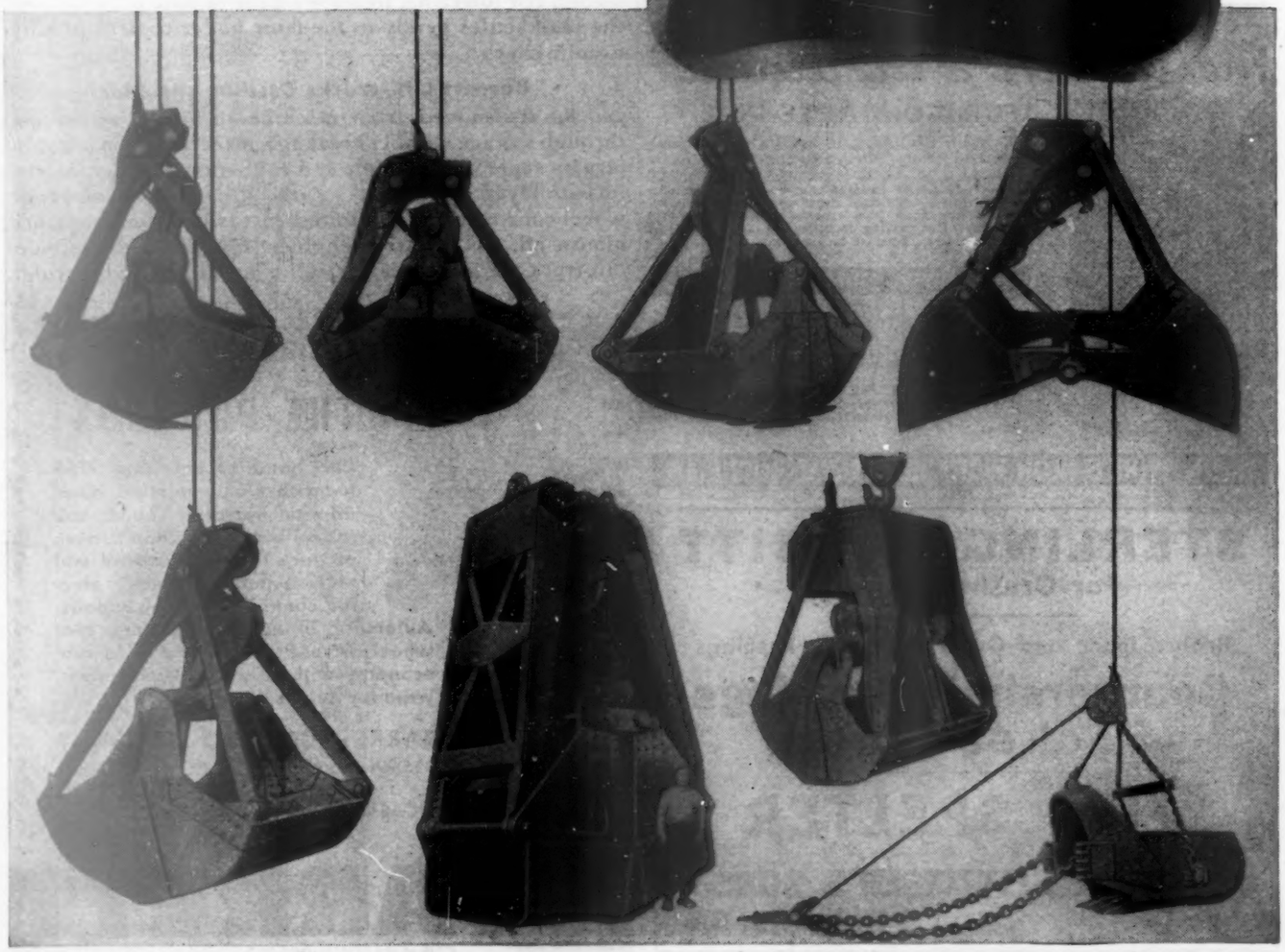
AGGREMETERS ★ TRAVELING CRANES
PORTABLE CONCRETE PLANTS



CHASE . . . for 35 years

the leading maker of lift-truck racks and cars for the concrete products industry.

● Style 294 Hinged Deck Lift Truck Racks in block plant of Cleveland Builders Supply Co., Cleveland, Ohio.

ANY STYLE OR DESIGN LIFT-TRUCK RACK OR CAR FOR YOUR PLANT

Write for Catalog

THE CHASE FOUNDRY & MANUFACTURING CO.
Columbus 7, Ohio

Make 6" to 48" CONCRETE PIPE with ONE Machine

Produce Pipe Profitably

Universal's "All-Purpose" Machine produces Concrete Pipe in all sizes from 6" to 48"—and shows you a worth-while profit. With a tamping capacity of 680 strokes per minute, your product is more dense, durable, finished in appearance. We can also outfit you for making larger sizes, up to 135".

Write today for Catalog and Details.

UNIVERSAL Trade Mark

CONCRETE PIPE CO.
Columbus 15, Ohio

3 CU. YD.

IN COMPARISON WITH JAEGER'S "SPEED MERCHANT," ANY OTHER TRUCK MIXER IS 5 YEARS OLD

2 CU. YD.

THESE FEATURES ARE OBSOLETE TODAY

- Movable Hoppers and Hopper Seal Troubles
- Top-Heavy Overhead Water Tanks
- Vital Parts Exposed to Dirt and Weather
- External Drum Gears and Power Drive Alignment Problems
- Inaccessible Internal Reversing Clutches
- High Center of Gravity, Awkward Chute Hangers, Etc., Etc.,

"HI-DUMP" OR "LOW CHARGE": The improvements shown in these HI-DUMP models are also available in "LOW CHARGE" types up to 5½ cu. yd. sizes.

4½ CU. YD.

If you want the public to know that you intend to maintain up-to-date "ready-mixed" service in your community, the quickest way to tell them is to put one of these 1945-model Jaegers on the street. In appearance, in construction and in speed and efficiency of operation, they make previous truck mixer designs completely out-of-date. Talk to your Jaeger distributor or write us for new Catalog TM-5.

THE JAEGER MACHINE CO.
Main Office and Factory — Columbus, Ohio

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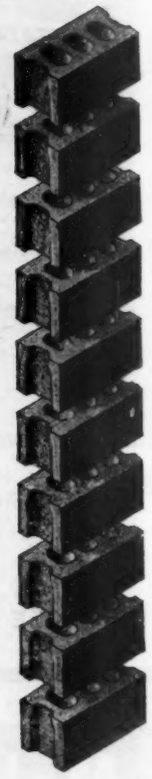
AIR COMPRESSORS, MIXERS, PUMPS, HOISTS, PAVING MACHINERY, TRUCK MIXERS—DISTRIBUTORS IN 120 CITIES

Fourth "E" awarded March 10, 1945



STEARNS *Improved* JOLTCRETE No. 9

This machine with <u>one</u> operator easily makes 9 to 11 perfect 8" blocks per minute!

- **Lowest in first cost,** including pallets of any comparable machine.
- **Lowest in production cost:** One-man operation adds to profits margin.
- **Lowest in maintenance cost:** Fewer wearing parts, lower replacement costs.
- **Flexibility:** Makes all sizes and shapes of blocks. Mold box changes are quickly made.
- **Greater Simplicity:** Fewer working parts.
- **Uses cored pallets** with all their advantages.
- **Recent Improvements:** Automatic carriage drive mechanically delivers blocks to Offbearer. Power Offbearer conveys blocks to racks. Both eliminate hand labor. Like all Stearns improvements, these can be added to present Joltcretes.

Write for new Joltcrete folder illustrating and describing the details of No. 9 and No. 7—a model of smaller capacity.

STEARNS

GENE OLSEN, PRESIDENT

Designers and manufacturers of Vibration and Tamp-Type Block Machines . . . Mixers . . Skip Loaders.

Licensed under basic Gelbman Vibration Patents

You won't find GENERAL EXCAVATOR listed in the Mortality Tables!

EVERY GENERAL BUILT SINCE 1927, ON WHICH THERE IS A RECORD, IS STILL AT WORK!

It's a fact! Every General Excavator built during the past 18 years, on which we are able to check, is still in action: doing a good day's work every day. Our records cover 98% of all Generals manufactured; the other machines are those sold by their original owners and on which we do not have recent information.

That's the kind of a performance record that has built confidence in General Excavators and Supercranes . . . confidence that will mean even more Generals at work during the postwar era. Include General in *your* postwar equipment plans! Get all the facts about the complete General line and be sure to inquire about the revolutionary new . . .

GENERAL TYPE 10

Combination Crane, Shovel, Dragline and Backhoe—One Man Controlled—One Engine Operated—On Rubber Tires

POSTWAR PRIORITY ORDERS NOW BEING BOOKED

BUY MORE WAR BONDS—KEEP THE BONDS YOU BUY

THE OSGOOD COMPANY
SHOVELS, DRAGLINES
CRANES
CRAWLER & WHEEL MOUNTS
DIESEL, OIL, GAS, ELECTRIC

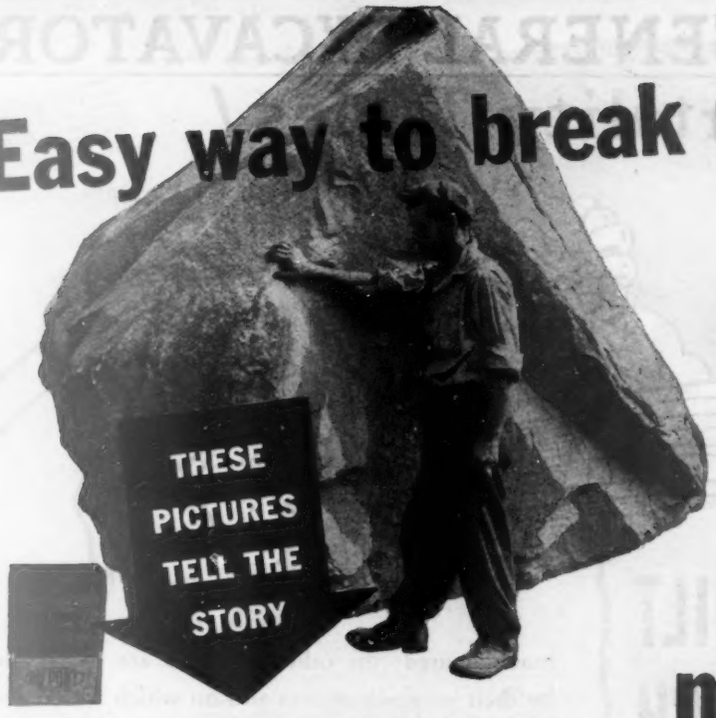
Associated with The Osgood Company

GENERAL EXCAVATOR CO.
MARION, OHIO

CRANES-SHOVELS MARION OHIO U.S.A. GENERAL OSGOOD

CRANES, DRAGLINES AND SHOVELS

Easy way to break up big ones...



HI-VELOCITY GELATIN saves labor, money and time

1. Du Pont research scores again by giving you a new method of secondary blasting. With Du Pont "Hi-Velocity" Gelatin dynamite it is not necessary either to remove the explosive from the wrapper or to confine the charge with mud.

2. A charge of Du Pont "Hi-Velocity" Gelatin is placed on the boulder above. Because this powerful dynamite always detonates at its highest velocity, less is required, saving from ⅓ to ½ the amount of explosives normally used for secondary blasting.

3. Blasting cap and fuse are attached to the primer. Cartridges weigh a pound each, so that the required charge can be measured readily. No handling of the raw dynamite is necessary.

√ CHECK THESE FEATURES OF "HI-VELOCITY" GELATIN:

1. **DEPENDABLE.** "Hi-Velocity" Gelatin always detonates at its top velocity.
2. **ECONOMICAL.** Saves labor . . . reduces explosives cost.
3. **CONVENIENT.** Easy to handle . . . easy to measure. Available in cartridges of 1¾" x 8" weighing 1 lb., also 3" by 5 lbs.; 4" by 10 lbs.; 5" by 25 lbs.

4. Result of the blast . . . the strong, shattering action of "Hi-Velocity" Gelatin has broken the big boulder into pieces that can easily be moved. Labor, money and time have been saved.

Ask your Du Pont Explosives representative about this simple and economical method of secondary blasting. He'll be glad to give you full details. E. I. du Pont de Nemours & Co. (Inc.), Explosives Department, Wilmington 98, Delaware.

DU PONT

DU PONT EXPLOSIVES

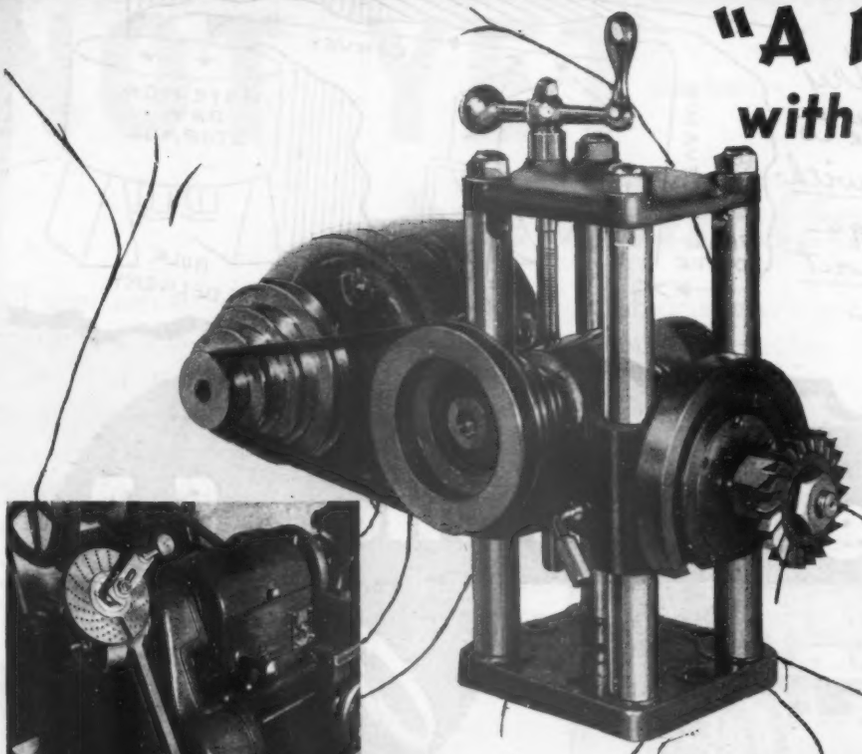
BLASTING SUPPLIES AND ACCESSORIES

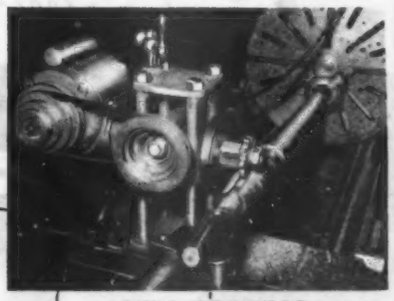
"A NEW HAND"
with Nimble Fingers

FOR MAINTENANCE

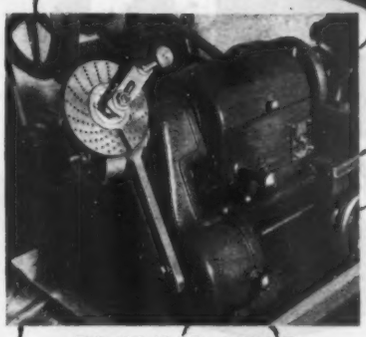
AND

PRODUCTION MEN

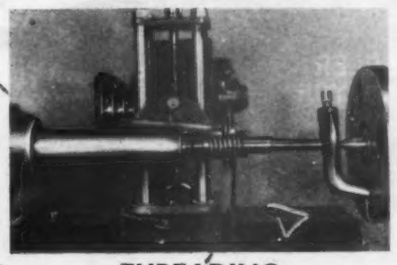




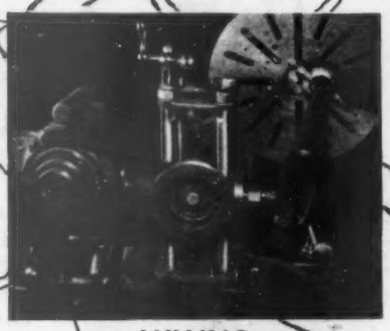
KEY SEATING



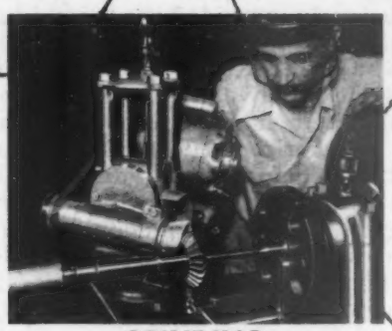
DIVIDING HEAD



THREADING



MILLING



GRINDING

THE MASTER LATHE CONVERTER

VERSATILE . ACCURATE . FAST!

Maintenance and production men are constantly called upon to repair a broken part or make a new tool. Speed is imperative. Shut-downs and production delays are costly. More often than not the needed part or tool requires a great many different machine operations, more delays. Pulling single purpose machines out of regular production and setting them up for special operations adds more cost.

The answer is: the Master Lathe Converter — it's portable, compact, simple, and accurate. The interchangeable heads can be quickly adjusted to perform almost any metal operation. For versatility, accuracy, and speed, equip with a Master Lathe Converter!

Catalog No. 10 includes Operating and Maintenance Manual — ASK FOR IT

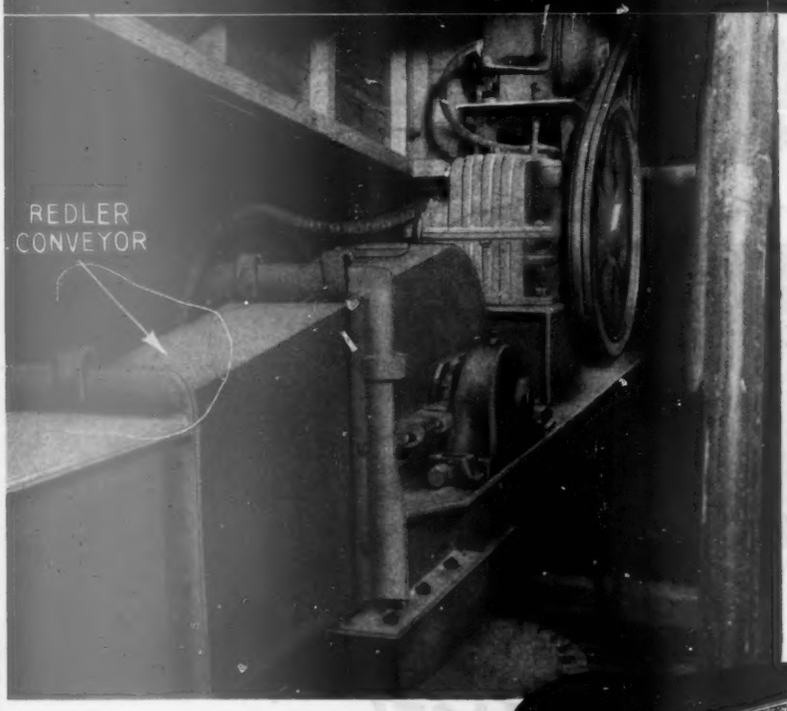
the MASTER MANUFACTURING COMPANY
HUTCHINSON, KANSAS, U. S. A.

MM
LATHE CONVERTER

ADDRESS DEPT. PQ

The Problem — elevate and convey dry fluorspar concentrate to multiple storage with maximum storage capacity and without loss or exposure of material

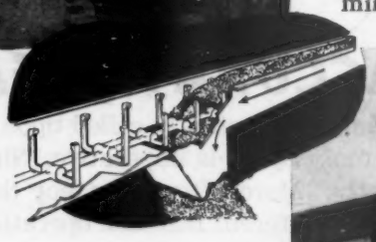
A Tough Nut...How S-A CRACKED IT



Here again is a case where the right equipment installed right, provided the practical answer to a tough handling problem. Using a Bucket Elevator and a REDLER Conveyor, S-A engineers designed the highly efficient system shown here.

Pulverized material from the dryer is elevated to a horizontal REDLER Conveyor. This REDLER, equipped with discharge openings which can be regulated by S-A rack and pinion slide gates, fills inside storage bins over baggers, continues through the building and delivers to an exterior bulk delivery tank.

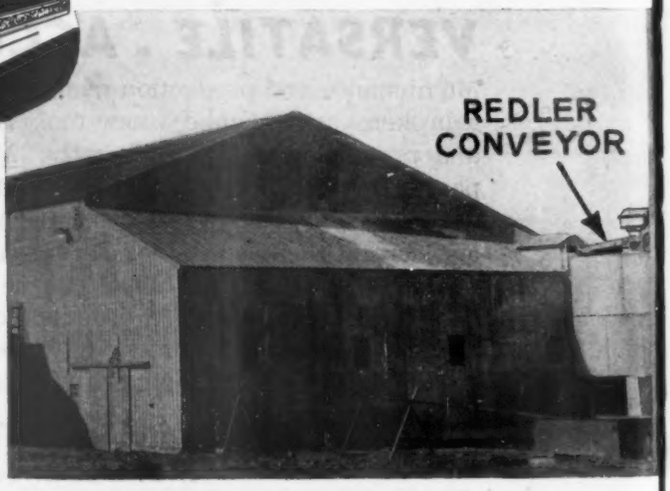
The weathertight REDLER casing eliminates the need for conveyor housing, and requires a minimum of supporting structure.



ABOVE
The discharge end of the REDLER Conveyor. Note the sealed casings which prevent loss of material as dust. Both the REDLER shown here and the Bucket Elevator are operated with SACO Speed Reducer drives.

INSERT
Showing how the REDLER moves pulverized, granular, small lump or flaky materials . . . up, down, on an incline or around corners . . . in dust-tight casing. Permits extremely compact installations.

RIGHT
This is an outside view of the building, and shows the REDLER and exterior bulk delivery tank. Material discharges from the REDLER Conveyor directly above the tank, to gain maximum storage capacity with minimum headroom.



STEPHEN S-A ADAMSON MFG. CO.

2000 RIDGEWAY AVENUE, AURORA, ILLINOIS — LOS ANGELES, CALIF. ★ BELLEVILLE, ONT.

Designers and Manufacturers of All Types of
BULK MATERIAL HANDLING EQUIPMENT

NOT YET—

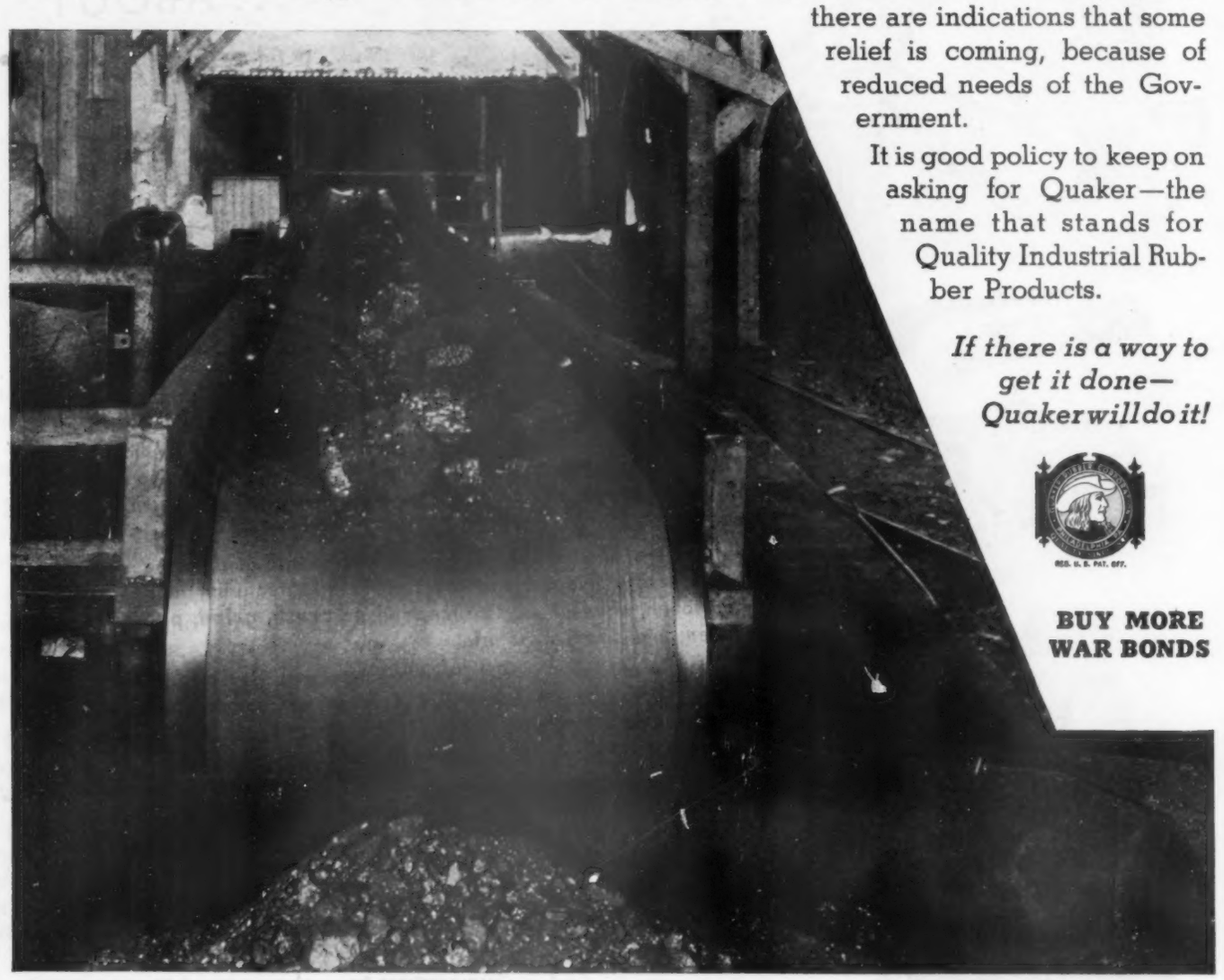
but definitely coming!

All the Industrial Rubber Goods you want. Big massive conveyor belts; hose of every description; tubings; rod and sheet packings; moulded articles—just the type of products needed to keep industry humming.

Right now this seems too good to be true. There are, however, indications that point to considerable more production being available for civilian needs.

Quaker is looking forward to the time when we can again give that type of service to our thousands of accounts to whom speed and promptness mean so much.

Quaker, along with other rubber manufacturers, have been doing a magnificent job to keep vital rubber products supplied to the vast war machine. It has been a tremendous job, and there are indications that some relief is coming, because of reduced needs of the Government.



It is good policy to keep on asking for Quaker—the name that stands for Quality Industrial Rubber Products.

If there is a way to get it done— Quaker will do it!

BUY MORE WAR BONDS

QUAKER RUBBER CORPORATION

Manufacturers INDUSTRIAL RUBBER PRODUCTS

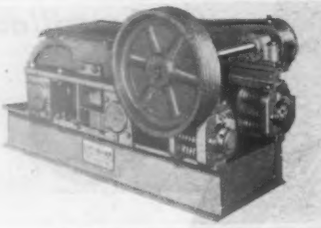
PHILADELPHIA 24, PA. • NEW YORK 7 • CLEVELAND 15 • CHICAGO 16 • HOUSTON 1

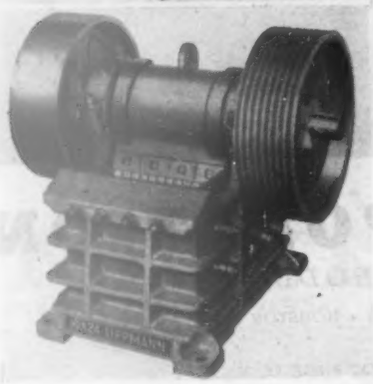
Western Territory

QUAKER PACIFIC RUBBER COMPANY • SAN FRANCISCO 5 • LOS ANGELES 21

Did You Ever Wonder...

... ABOUT THE PART ENGINEERING PLAYS IN THE MANUFACTURE OF CEMENT?





Behind those roaring transports stretches an industry that is more important today than ever . . . for it is an industry committed to the gigantic task of helping to build a world . . . a world in which old cities will expand and new cities will arise to be cemented together in a homogeneous web of new concrete highways, bridges, airports, and harbors.

A world like this will require tremendous quantities of cement . . . and to satisfy this demand the cement manufacturing indusry will need tough, efficient, reliable machines to ***crush, grind, pulverize, screen,*** and ***convey*** material.

Years of study spent in field and laboratory to develop machinery capable of handling these various processes of cement manufacture has enabled LIPPMANN ENGINEERING to produce Jaw Crushers, Roll Crushers, Pulverizes, Screens, and Conveyors that are consistent leaders in their field . . . unsolicited testimonials from users are constantly praising the Service—Production—and Efficiency derived from LIPPMANN equipment.

Why not write today to LIPPMANN ENGINEERING WORKS, Milwaukee 14, Wisconsin for information regarding these material handling and processing machines?

LOOK FOR MANUFACTURED BY LIPPMANN ENGINEERING WORKS MILWAUKEE WISCONSIN THIS NAMEPLATE

LIPPMANN CEMENT MACHINERY

HOW TEAMED-UP B-G STACKERS PILE UP BIG TONNAGES WITH LITTLE UPKEEP

Simultaneous, continuous, and *high speed* surge storage of several sizes of aggregate by 110-foot Barber-Greene Stacking Conveyors—that's the answer to this huge crushing plant's low stockpiling costs.

No other material handling equipment is so stingy with power . . . requires so little attention . . . maintains such high capacity hour after hour with such economy of upkeep.

No matter what type of conveying equipment you need, you're bound to benefit by Barber-Greene *prefabrication*. Drives, carriers, take-ups, and trusses are *standardized*. Units are interchangeable. Alterations, rearrangements, and relocations are quickly and easily made.

B-G *pre-engineering* saves you many dollars of needless expense in maintenance and belt replacement—saves time and labor in permanent conveyor installations.

Barber-Greene builds many types of portable and permanent conveyors. When you have a material handling problem call on B-G engineers to help you. They'll show you how B-G Conveyors can do the job cheaper and more efficiently. Barber-Greene Company, Aurora, Illinois.

Nothing beats a B-G Bucket Loader for reclaiming bulk materials from stockpiles. It's fast, easy to maneuver, and gives many years of trouble-free, economical service. Built in various sizes and models.

45-22

Barber-Greene B-G *Constant Flow Equipment*

SECO'S *Sharper Whip*

Pays Off

by Screening

MORE TONS PER HOUR

Like the whip that adds to a boxer's wallop, Seco's sharp, yet controlled motion sends material more quickly and more thoroughly through the meshes. All this is due to Secos' patented method of connecting the live body to the base frame. Operators everywhere report increased capacities, minimum of blinding, excellent conveying action and long, dependable service with Seco Vibrating Screens. Send for Free Catalog today! Dept. A.

SECO **SCREEN EQUIPMENT CO., INC.**
9 Lafayette Avenue, Buffalo 13, N. Y.

NEW LEADER Truck Body Type

LIME SPREADERS

Can Now Be Purchased Without Triple AAA Certificates or Priority

THE above picture shows a rear view of the new model NEW LEADER marl and lime spreader. This spreader is equipped with an extra wide conveyor and two distributor discs and is strictly a one-man spreader. You will be able to haul wet lime or marl and, due to the large opening in the back end of the spreader, material will always feed onto the distributor disc evenly.

This spreader has many outstanding features. Both gear boxes driving the distributor discs are equipped with cut steel gears and ball-bearings running in a dust-proof and oil-tight gear case. The large gear box driving the wide chain conveyor is equipped with a steel ring gear and pinion and a thrust bearing also running in a dust-proof and oil-tight gear case. Bearing hangers are placed underneath the distributor discs; these are also equipped with ball bearings. This helps to carry the weight of the distributor discs and the load, the weight not being suspended from the gears in the small gear box. With this arrangement you are assured longer lived gears. The framework of the spreader is of hardwood.

These spreaders can now be purchased without priority or certificates of any kind. Write us for any additional information, also prices.

HIGHWAY EQUIPMENT COMPANY, INC.

Manufacturers of the World's Most Complete Line of Spreaders, Including Lime Spreaders, Sand and Cinder Spreaders, Chip Rock, Clay and Dirt Spreaders.

CEDAR RAPIDS, IOWA, U. S. A. Phone 32017-32018

DESIGNED TO DO A BETTER JOB FASTER

LIMA shovels, cranes and draglines are engineered all the way through to do a better job faster. They have the power and ruggedness required for the tough going, plus fast digging cycles for big output. They are equipped with independent clutches which make possible simultaneous operation (hoist, swing, travel and boom up or down at the same time), long wide crawlers to meet all ground conditions, anti-friction bearings at every vital bearing point for smooth trouble free operation. These are but a few of the many advantages LIMA has to offer when you make your plans for the future.

LIMA

LIMA LOCOMOTIVE WORKS
INCORPORATED
Shovel and Crane Division, Lima Ohio

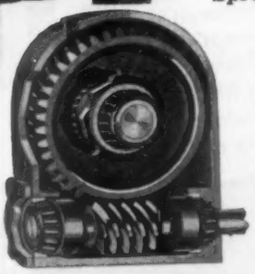
FOR PERFECT SPREADS USE A BAUGHMAN

The machine that made LIME popular!

Patented and Patents Pending.

View of a 6½ ton load in a 11-foot body.

View of our heavy, cut steel and bronze, 15 to 1, Gear Reduction. All gears are straddle mounted between Timken tapered roller bearings, sealed against dirt and running in a bath of oil. Simple, efficient, trouble-free — will give years of service.



BAUGHMAN ALWAYS SETS THE PACE!

Here is the all-around machine you have been waiting for — put it on your truck and use it the "whole year 'round." Spreading lime is only one of the many jobs this model will do!

MODEL K Wide Throat Drag Chain Type

Steel Body and Undercarriage. Capacities, 5 to 15 tons. Made in 9, 11, 13, 15 and 17 lengths — and 19, 21, 23 and 25 foot lengths with sideboards.

Handles wet or dry lime. Timken straddle mounted bearings, ball and roller bearings throughout. Only two oil-sealed cases and 1 short roller chain drive. Automatic chain feed regulator. Automatic endgates — large endgate for fast dumping. New style automatic drag chain tightener with anti-wrap chain stop. Only 1 patented distributor used. Spreads from 35 to 45 feet depending upon truck speed.

Other Baughman "Hi-Speed" Equipment

Model C, Cinder and Chip Spreader
Model N, Dump Body Lime Spreader
Model P, Phosphate Spreader
Motor or Farm Tractor Drive Spreader
Model F, Flat Bed Type Spreader
Model J, Transfer Unloader or Dump
Model L, Car Unloader
Model M, Car Unloader

Ask for recommendations—we have a reliable distributor near you.

manufactured exclusively by
BAUGHMAN MANUFACTURING CO., Inc.
Factories • JERSEYVILLE, ILLINOIS

CASE NO. 3

• NO DELAYS DUE TO RAINSTORMS..

'We sprayed a mixture composed of M. C. 2 cut-back asphalt to which had been added 1½% by volume of **NOSTRIP** upon a section of very wet gravel surfaced road with a power spray nozzle attached to a Littleford Asphalt 4 bbl. kettle. Upon this sprayed surface **in the rain** we spread ¾ inch minus broken stone uniformly, and rolled with 5 ton roller. Immediately following this operation, **still in the rain,** we repeated the process. After 24 hours . . . we covered this with stone chips as above and again rolled it. This method gives very excellent results **although carried out in the rain."**

*Above is an excerpt of a letter from a County Road Engineer in a Northwestern State. Name on request.

your first drum

is our best salesman!

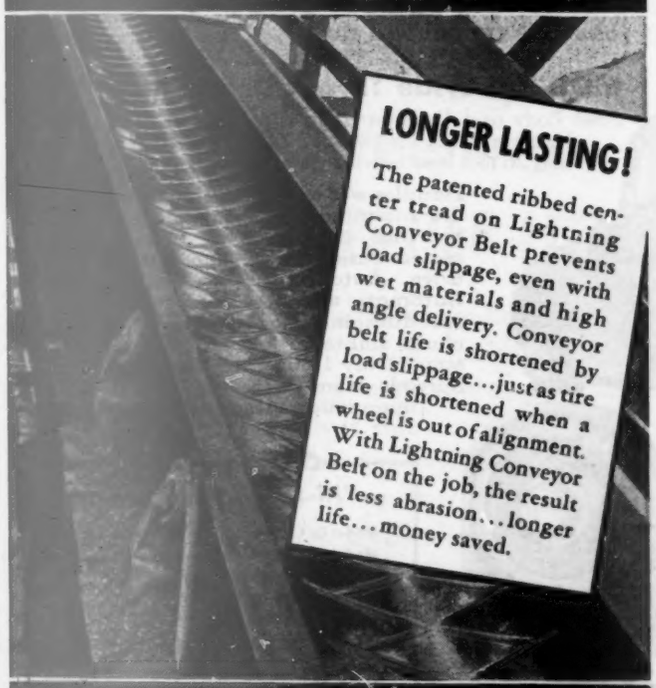
THE ALL-YEAR ROAD MATERIAL

NOSTRIP

AN ADMIXTURE FOR TAR AND ASPHALT

MAGUIRE INDUSTRIES, INCORPORATED • NOSTRIP DIVISION • 122 E. 42nd ST. NEW YORK, 17, N.Y.

Lightning RIBBED CENTER
CONVEYOR BELT



LONGER LASTING!

The patented ribbed center tread on Lightning Conveyor Belt prevents load slippage, even with wet materials and high angle delivery. Conveyor belt life is shortened by load slippage...just as tire life is shortened when a wheel is out of alignment. With Lightning Conveyor Belt on the job, the result is less abrasion...longer life...money saved.

The AMERICAN RUBBER Mfg. Co.
PARK AVENUE AND WATTS STREET • OAKLAND 8, CALIF

YOU ALWAYS GET
PEAK PERFORMANCE FROM

BLAW-KNOX BUCKETS

Every Blaw-Knox bucket is designed for a specific purpose—the greatest output from your crane.

★

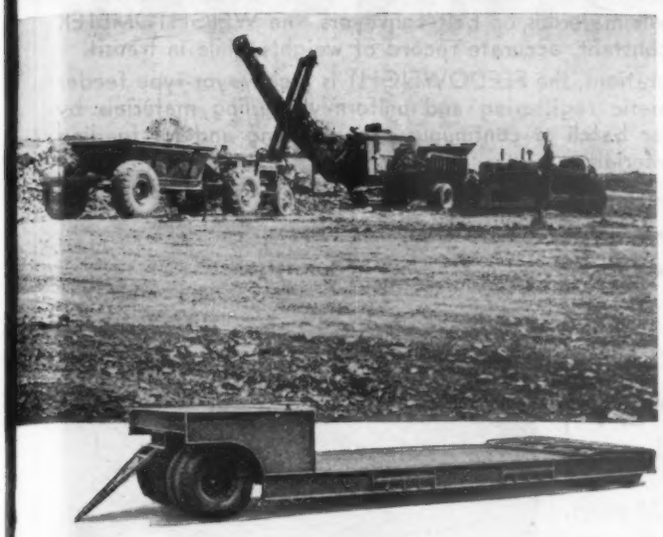
BLAW-KNOX BUCKETS in over 100 types and sizes are illustrated and described in Catalog 1757 . . . send for your copy today.

BLAW-KNOX DIVISION
of Blaw-Knox Company
2004 FARMERS BANK BLDG.
Pittsburgh, Pa.
New York • Chicago • Philadelphia
Birmingham • Washington
Representatives in Principal Cities

MAKE 'EM LAST

Bulletin 2004 gives complete instruction on the Care and Maintenance of Clamshell Buckets . . . copy on request.

HANSON



Heavy Duty

Goose Neck... Low Platform

MACHINERY TRAILERS

CAPACITY: 10 TO 40 TONS... SEMI OR FULL

● Every successful engineer and contractor knows that his jobs depend on the 4 "G's" —

Get there.. Get going.. Get done.. Get on!

In two out of these four operations Hanson Trailers are big assets. They enable you to get there fast and to get on fast, with top loads and minimum haulage costs.

For your own haulage needs, check these important Hanson features — Heavy duty, goose-neck construction; Semi and Full types; 10 to 40 ton capacity; Oscillating rear axles; Pneumatic tires; Brakes of internal expanding, air or vacuum type; Timken bearings throughout.

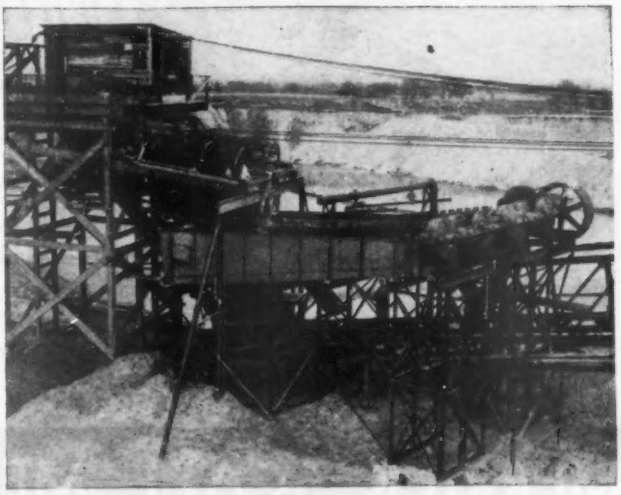
Send for folder 745 covering specifications and capacities stating size of Trailer you require.

THE HANSON CLUTCH & MACHINERY CO.
TIFFIN, OHIO

McLANAHAN

improved STEEL LOG WASHERS

Insure Greater Capacity . . . Lower Costs . . . Clean Products . . . Constant Demand and Higher Prices with Less Stripping



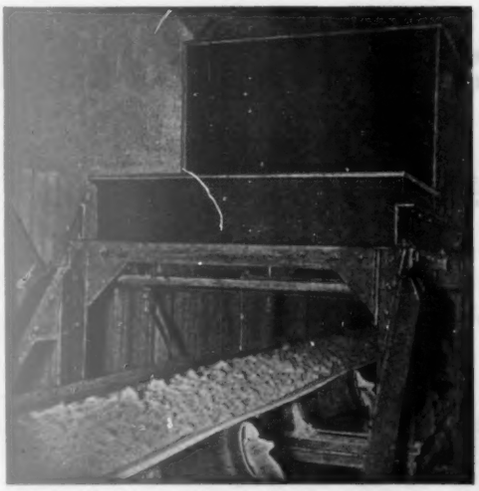
Three 30' Heavy Duty Double Logs with McLanahan Drag Washing Sand and Gravel in a large Mid-Western plant.

Here are a dozen reasons for McLanahan Steel Log Washer Superiority . . .

1. Each electrically welded steel log with welded bases driven separately.
2. Oversize steel log shaft gudgeons.
3. No twisting, sagging, or warping.
4. Improved interchangeable and reversible paddle arrangement.
5. All renewable bronze bushed bearings in discharge end.
6. Shafts, bearings, and steel gears held rigidly in safety housing and running in oil.
7. Rear bearings adjustable.
8. Adjustable overflow and discharge spouts.
9. Industrial lubricating fitting.
10. V or flat belt drives.
11. Minimum water requirements.
12. All self-contained in steel box ready to place on foundations.

Descriptive Bulletins On Request

McLANAHAN & STONE CORPORATION
Pit, Mine and Quarry Equipment Headquarters
Since 1835
HOLLIDAYSBURG, PENNSYLVANIA



The WEIGHTOMETER for automatic, continuous precision weighing.

CEMENT PLANTS and other industrial works have demonstrated the dependability, economy and accuracy of Merrick WEIGHTOMETERS and FEEDOWEIGHTS.

If you handle bulk materials on belt conveyors, the WEIGHTOMETER will provide a constant, accurate record of weights while in transit.

For feeding operations, the FEEDOWEIGHT is a conveyor-type feeder scale for automatic registering and uniformly feeding materials by weight. Ideal for batch or continuous proportioning and for feeding two or more materials.

WEIGH *while you* CONVEY

The FEEDOWEIGHT — an automatic, continuous feeder scale.

MERRICK Weighing Devices have been serving industry for 30 years. Most of the early installations are still giving honest, accurate service. The company's best testimonial is the large number of repeat orders for additional Merricks from these same users.

Merrick engineers are ready at all times to help you work out your weighing problems. Tell us your requirements.

MERRICK SCALE MFG. CO., 183 SUMMER STREET PASSAIC, N. J.

Welded for Strength & Service

WELLMAN

Williams BUCKETS

Welded Rolled Steel construction builds longer life and greater utility into Wellman buckets. Multiple Rope and Power Arm types. Dragline. Power Wheel. Special Service Buckets. ⅜ to 16½ yd. capacity.

Send for Bulletin

THE WELLMAN ENGINEERING CO.
7014 Central Avenue • Cleveland 4, Ohio
Sales and Service Agencies in Principal Cities

THE PROFIT is in the DIGGING!

MORE OUT PUT

IN PAY MATERIAL PER BUCKETFUL

- ★ 20% to 40% lighter than other buckets, type for type.
- ★ All welded construction for greater strength and durability.
- ★ Manganese Steel chains, fittings, and reversible tooth points.
- ★ Full Pay Load every trip, even in wet diggings.
- ★ Perfect Balance; handles easier, fills faster, dumps quicker.
- ★ Three Types; light, medium, and heavy duty. With or without perforations.

⅜ to 30 Cubic Yards

HENDRIX *Lightweight* **DRAGLINE BUCKETS**

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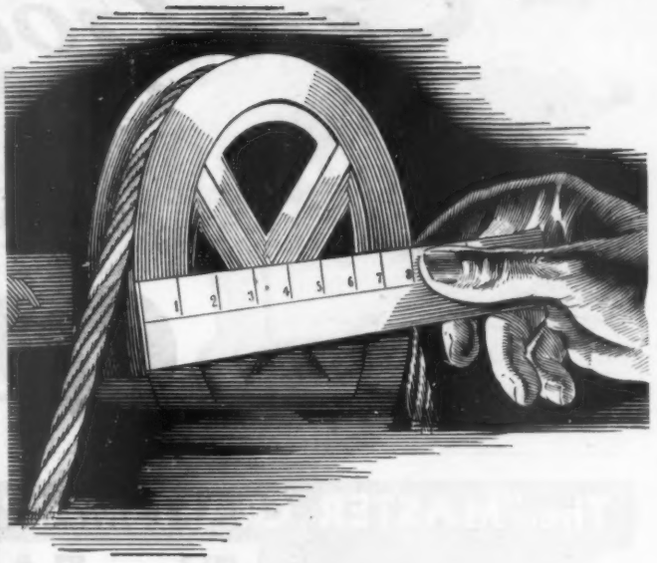


Small Sheaves

call for the flexibility of *PREFORMED* YELLOW STRAND

In a lot of rock-handling equipment, old and new models will have one feature alike: small sheaves—perhaps accompanied by small drums. Either is tough on wire rope. Both should remind you to *minimize* their fatiguing effect by using *Preformed* Yellow Strand.

The *flexibility* of *Preformed* Yellow Strand enables it to hold its own *longer* against fatigue aggravated by severe bending, high speeds and heavy loads. The wires and strands can concentrate on the *external* bending job because *internal* stresses have been virtually neutralized during manufacture.

Along with greater endurance, smooth-running *Preformed* Yellow Strand offers faster installation . . . higher kink-resistance . . . increased safety. Specify *Preformed* Yellow Strand by name—for shovels, draglines, clam shells and other heavy-duty machines.

HAND BOOK FREE: "Industrial Wire Ropes" contains useful facts, tables, pictures. Write for your copy.

Broderick & Bascom Rope Co., St. Louis

Branches: New York, Chicago, Houston, Portland, Seattle

Factories: St. Louis, Seattle, Peoria

BRODERICK & BASCOM

Yellow Strand

PREFORMED WIRE ROPE

Sea Going

LIKE THE RUBBER LIFE RAFT

Certain types of Owen Buckets have grit-tight bearings, special lubrication and other features to adapt them to underwater digging and assure long life under this difficult service.

The OWEN BUCKET Company
6050 Breakwater Avenue • Cleveland, Ohio
BRANCHES: NEW YORK PHILADELPHIA CHICAGO BERKELEY, CAL.

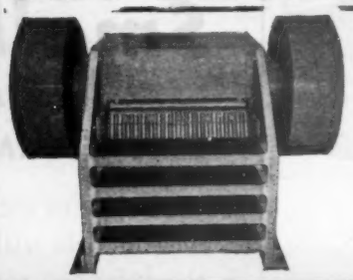
OWEN BUCKETS

A MOUTHFUL AT EVERY BITE

The "MASTER CRAFTSMAN" in Profitable Rock Reduction

RIGHT this way

The EAGLE Jaw Crusher



. . . tops the field for dependability under all working conditions. An outstanding heavy-duty machine, featuring all steel welded frame, reversible jaws and dustproof bearings. Capacities up to 1500 tons per day.

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IMPACT BREAKERS
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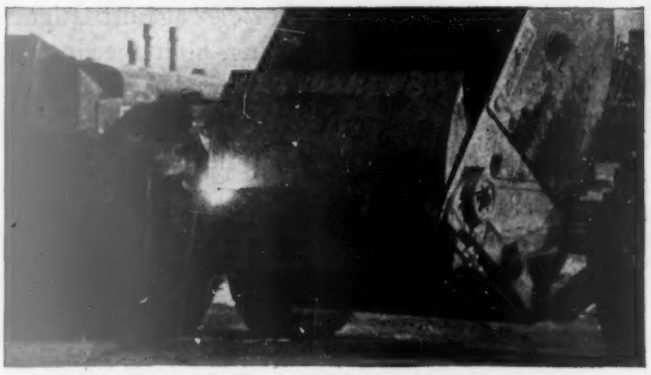
CONVEYORS
LOADERS

EAGLE CRUSHER CO., INC., - - - Galion, Ohio



QUICK REPAIRS RIGHT ON THE JOB

Don't let breakdowns mean long lay ups! Repair-weld your equipment on the job. Do it in a few hours—save days required to obtain replacement parts.

You can prolong the life of your equipment indefinitely—by building up and hard-surfacing with P&H Welding Electrodes. P&H welding engineers will be glad to help you as to the type to use and procedure to follow. The complete P&H line of welding electrodes includes a size and type for every requirement—for repair-welding; or for building up and hard-surfacing to provide unusual resistance to wear, impact and abrasion.

TODAY call your nearest P&H representative—he's ready to help you. Or if you wish, write us for complete-line booklet.

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If you grade, size, or classify your products by physical dimensions, you can undoubtedly use CALWICO woven wire screens to advantage.

Determine the size of opening which will pass a given object, whether it be a tiny grain of cement or crushed rock the size of your fist—we will weave a screen that will meet your specification exactly.

You can speed up and reduce your costs of sorting and sizing with CALWICO INDUSTRIAL SCREENS. Write The California Wire Cloth Corporation, 1001 22nd Avenue, Oakland, California.

CALWICO

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"MIR-O-COL HARD-FACING MAKES THE FLANGE OUTLAST THE WATER LINE," Says Cement Mixer Operator

Abrasive action of wet cement mix wore companion flanges below the bolt holes, causing water lines to drop away from the inlet port on traveling cement mixers owned by Transit Mixed Concrete Co., Pasadena, California. "We used your MIR-O-COL No. 2 (Production) hard-facing to lay ¼-inch beads around the flange edges, and now the 2-inch water pipe wears out before the flange," Howard A. Switzer, part-owner, stated. In case histories reported from all over the country, wherever wear eats metal MIR-O-COL hard-facing helps reduce maintenance costs—adds to operational profits. Write now for the name of your nearest distributor. He can tell you how to apply MIR-O-COL metals in your business.

ASK FOR THIS BOOK

Send your name and address to MIR-O-COL ALLOY COMPANY for your FREE copy of "Weldor's Guide to Successful Hard-Facing." Also indicate if you desire to receive a monthly copy of "Mir-O-Col News."

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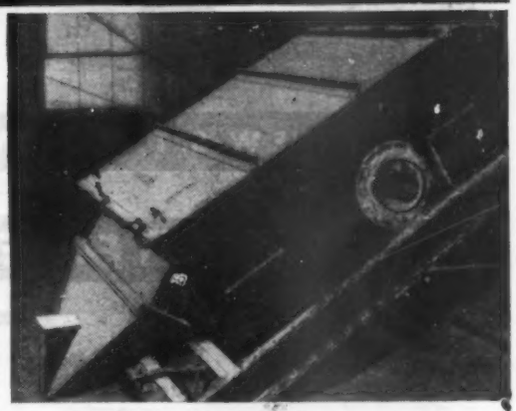
For Tough Screening Jobs—
LINK-BELT VIBRATING SCREENS



Made in various standard sizes—single or multiple decks, with or without enclosures.

● Accurate sizing of damp, dry or sticky materials is successfully accomplished with L-B Screens. Their design includes many outstanding engineering features as a result of over 20 years' experience in solving all types of screening jobs. It is your assurance of maximum production and long life of screens. Investigate Link-Belt on your next screening problem.

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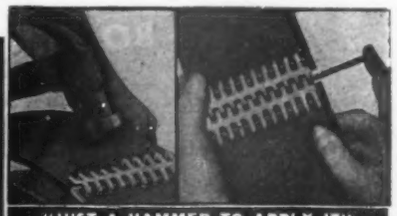
BELT LACING and FASTENERS for transmission and conveyor belts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ALLIGATOR
Trade Mark Reg. U. S. Pat. Office

STEEL BELT LACING

World famed in general service for strength and long life. A flexible steel-hinged joint, smooth on both sides. 12 sizes. Made in steel, "Monel Metal" and non-magnetic alloys. Long lengths supplied if needed. Bulletin A-60 gives complete details

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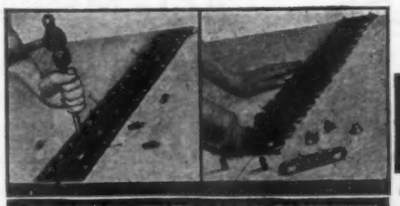
BELT FASTENERS AND RIP PLATES

For conveyor and elevator belts of all thicknesses, makes a tight butt joint of great strength and durability. Compresses belt ends between toothed cupped plates. Templates and FLEXCO Clips speed application. 6 sizes. Made in steel, "Monel Metal", non-magnetic and abrasion resisting alloys.

By using Flexco HD Rip Plates, damaged conveyor belting can be returned to satisfactory service. The extra length gives a long grip on edges of rip or patch. Flexco Tools and Rip Plate Tool are used. For complete information ask for Bulletin F-100.

Sold by supply houses everywhere


"CONVEYOR BELTS EASILY FASTENED"

FLEXIBLE STEEL LACING CO.
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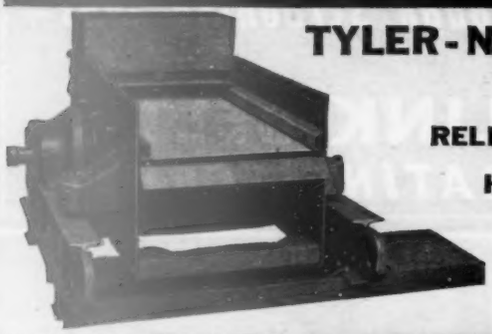
From the SMALLEST to the LARGEST TONNAGES



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TYLER-NIAGARA SCREENS

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RELIABLE

HIGH CAPACITY

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6' x 14' Type 900 Tyler-Niagara Screen

THE W. S. TYLER COMPANY, Cleveland 14, Ohio

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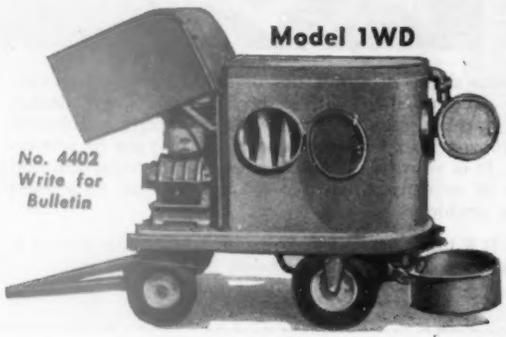
25 to 33 PERCENT *FASTER* DRILLING

MARKLEY-CARTER
PORTABLE DUST COLLECTOR
"Collects and Controls"



Model 1WD

No. 4402 Write for Bulletin

It's defeat day for dangerous and costly dusts on your rock drilling jobs.

This modern protective method

- Reduces silicosis hazard to safe hygienic limits
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- Reduces sharpening expense
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- Eliminates wet drilling

Keeps plant, motors, and machinery clean and free from harmful dusts.

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GOOD FOR ROUND TRIPS

RELIANCE

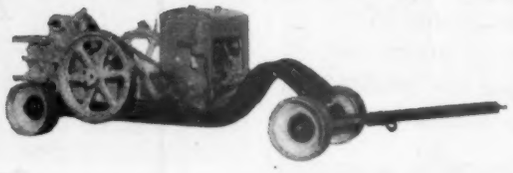
TO THE JOB AND BACK

NOW you can reach profitable jobs for miles around with the speedy Reliance portable rock crushing plant. It includes crusher, elevator, chute screen, engine and drive, complete and ready for action.

Compact unit is mounted on a four-wheel truck, steel or pneumatic tires. Low feed opening. V-belt drive. Engine fitted with clutch for easy starting.

RELIANCE Products include: Rock Crushers, Bucket Elevators, Revolving Screens, Street Sweepers, Storage Bins, Chip Spreaders, Belt Conveyors, Feeders, Separators, and other equipment.

PORTABLE CRUSHING PLANT



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SCREEN SERVICE!

RUGGED, DURABLE AND ACCURATE
ALL METALS ALL WEAVES

FOR ANY INDUSTRIAL APPLICATION

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Flotation is slowly being applied to beneficiate and concentrate various products in the chemical field which cannot be obtained by other methods. The Denver "Sub-A" is standard the world over because it has a number of exclusive advantages. Bulletin No. F11-B.

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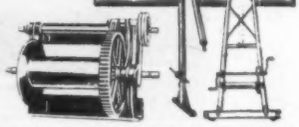
A Complete Line of Contractors' Derricks and Winches—Nationally Known for dependable service and long life.

Write for Catalog or send your problems to our Engineering Department.



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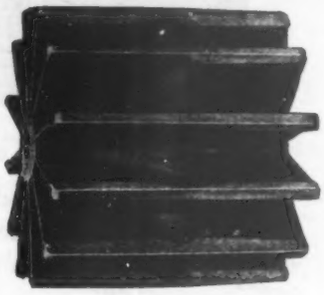
THOUSANDS OF USERS TESTIFY

that the **Belt-Saver Pulley** saves money and rubber and prevents accidents on their belt conveyors and bucket elevators.



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UNIVERSAL SCREENS

GUARANTEED to give you best results on your most difficult separations.

RUGGED - SIMPLE Construction. LOWEST in FIRST cost and MAINTENANCE cost.

Two-Deck Model 42" x 96" Motor & V-rope Dr

Catalog No. 107,—32 pages on Screens and Screening is yours for the asking.

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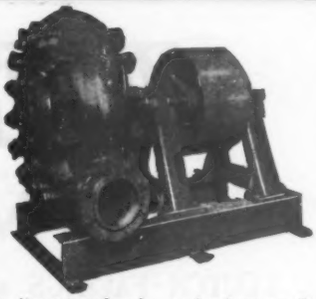
The Lightning Sand and Gravel Pumps

HEAVY-DUTY
(Ball-Bearing)
and Low Head Types

Complete stock of replacement parts, elbows and fittings carried for prompt shipment.



Replacement parts made to jig standards and always fit and always available.
For 30 years LIGHTNING pumps have faithfully performed the work they are intended for. We manufacture a type and size to fit the need. Simplicity of design and ease of handling have made these pumps one of the most popular. Write for catalog now.

Mfg. by
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SUPER-STAVE-PORTABLE BINS

Build up your storage capacity and automatic handling equipment now. Get set to meet the rush for sand, gravel and cement.

Neff & Fry bins are inexpensive but good for many years' service. Any capacity. Quick erection. Guaranteed. Get catalogue.

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Fire Clays, Coal, Limestone
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☒ VOTE **"YES"**

For this dependable, non-crystallizing, long-wearing Screen Cloth with "Nat-Aloy" Lock Crimp Meshes.

"IT'S THE PEOPLE'S CHOICE"

among profit-wise producers for precision separation and economical operation.

Stock shipments in all widths and all meshes. . . . write for catalog No. 55.

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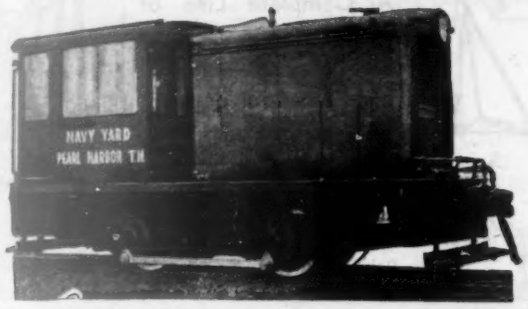
Haulage Power Fitted to YOUR Needs

STEAM—GASOLINE—DIESEL LOCOMOTIVES—ELECTRIC OR MECHANICAL DRIVE



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The correct fitting of a locomotive to a particular set of haulage conditions is as vital to efficient plant operation as the correct fitting of shoes is to the comfort and efficiency of an individual. Versatile Davenport Better-Built Locomotives are built in a wide range of types and sizes INDIVIDUALIZED to particular requirements.

Davenport engineers will be glad to analyze your haulage conditions and recommend the best type of unit for lowest Ton-Mile costs and extra years of general satisfaction.

Entrust Your Post-War Haulage to Modern Davenports

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DAVENPORT LOCOMOTIVE WORKS

A DIVISION OF DAVENPORT BESLER CORPORATION, DAVENPORT, IOWA

Contact COLUMBUS For CONCRETE EQUIPMENT

We have it . . . anything from a single bucket to a complete plant!

You're right—this compact, modern concrete plant is a COLUMBUS job!

COLUMBUS Products include a full line of screening, crushing, elevating, conveying and transmission machinery.

Some territory open for responsible representatives.

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Build for Production and Profit on a solid foundation of COLUMBUS Equipment.

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HENDRICK MANUFACTURING CO.
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Prompt Delivery

ON BOTH STANDARD TYPES

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—on **WIREGRIP** Belt Hooks that are applied with any lacing machine and come with extra blue aligning cards (patented) that assure uniform tension on every hook and prevent card-end waste.

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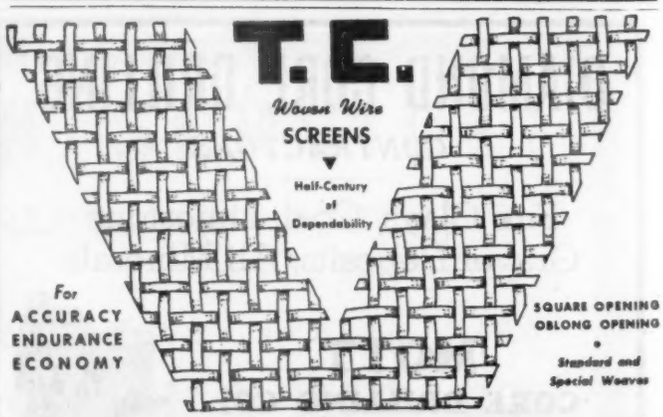
"The Belt Lacing People"
5386 Northwest Highway, Chicago 30, U. S. A.

T. C.

Woven Wire SCREENS

Half-Century of Dependability



For ACCURACY ENDURANCE ECONOMY

SQUARE OPENING
OBLONG OPENING

Standard and Special Weaves

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300 CUBIC YARDS (APPROXIMATE) AGGREGATE BIN. BULK CEMENT ELEVATOR AND SCREW. BARBER-GREENE BELT CONVEYOR.

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WANTED

1—Heavy Duty vibrating pan feeder, 2 units, No. 5 Jeffrey Traylor, or equal.
1—20 ton, 36 gauge, gasoline locomotive.

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THE NATIONAL LIME & STONE CO.
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WANTED TO BUY

Koehring Dumptors, Diesel powered

Write Box 607

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WANTED

1—25-B Telsmith Gyratory Crusher
3—15 ton trailer trucks with 12 Yard Easton 2 way side dump rock bodies.
1—16" or larger Diesel dredge complete for export.
1—Concrete block machine, complete for 1500 blocks 8x8x12".

R. E. BOGGS
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Experienced in designing and detailing of rock drills and pneumatic tools. Permanent position with large manufacturer in the East with good opportunity for advancement. All replies will be held confidential.

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Superintendent to assist in the erection of and to later operate a new Readi-Mix Concrete Plant.

FREDERICK G. SMITH & CO.
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WANTED

Foreman for lumber, coal, and building material yard to supervise workmen, trucks, and unloading of materials.

FREDERICK G. SMITH & CO.
327 E. Stephenson Street
Freeport, Illinois

Wanted
DIESEL ENGINES

Total 1600 HP required, with or without Generators. Consider units 225 HP and larger. Also smaller high speed units for standby service. Preference given units immediately available. Give complete details and price.

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WANTED IMMEDIATELY: One 6' Diameter x 22' and one 8' Diameter x 30' tube mill. Can be without lining. Center discharge preferred. Advise price, condition and location for inspection.

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Steam dinky locomotive, 42 gauge, 9 x 14, equipped to burn coal.

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in Central N. Y. State by long established Distributors of well known Construction, Industrial and Highway Equipment. Liberal commissions. Sales ability, Automobile and knowledge of Machinery necessary. Excellent future in fine territory for capable man.

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Cat D13000
Diesel
or equivalent Cummings power unit

Will purchase at ceiling price, or trade for desirable item from our large stock of used rebuilt construction equipment. Urgently needed!

Write or wire —

BOEHCK EQUIPMENT COMPANY
2404 W. Clybourn Street
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WEst 7810

PLANT ENGINEER

Exceptional opportunity available with national concern engaged in essential war activity and offering post-war opportunity.

Applicant should be around 35 years of age with mechanical background to become project engineer during construction and upon completion of plant take charge of engineering and technical work. Prefer man experienced in operation of crushing, grinding and screening machinery especially rotary kiln calciners in the lime or portland cement industry.

Reply, stating age, experience, education, salary expected and references. Include recent photo. Write **Box No. 703, Pit and Quarry Publications, 538 S. Clark Street, Chicago 5, Illinois.**

MACHINERY SALES ENGINEERS WANTED

Sales engineer positions available with large manufacturer of heavy machinery for technically trained men in mining, cement, crushed stone and heavy chemical industries. Prior sales experience desirable but will consider applicants who have natural inclination for sales and will train them for field assignments. Give full details of education, training and experience. All applications will be held confidential. Our Employees know of this advertisement. Address reply to

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ANYWHERE
We look into the earth
PENNSYLVANIA
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DRILLING CONTRACTORS
PROSPECTING, SAMPLING
BLAST HOLES & CLAY PITS

JUDD & SON
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WANTED
PLANT SUPERINTENDENT

Familiar with pipe, block or any special concrete product. Must have at least high school education, be mechanically inclined and have pleasing personality. Age limit 48. Postwar opportunity with large concern branching out into full line of products in various sections of the United States and operating on an incentive profit sharing plan. Past record must stand rigid inspection. Include photograph in reply. Address Box 709, care of

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Chicago 5, Illinois

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Manager for our Machinery and Equipment Department

Experienced with machinery and equipment used in heavy industries—like cranes, ground and overhead; steel buildings and structures, power plants, mining, contractors, etc. Drawing account and participation. Unusual opportunity for good high grade man. Confidences respected.

IRON & STEEL PRODUCTS, INC.
40 years' experience
13490 S. Brainard Avenue, Chicago 33, Illinois
"ANYTHING containing IRON or STEEL"

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SAUERMAN ONE YARD DRAG SCRAPER COMPLETE WITH DOUBLE DRUM HOIST, ROPES AND BLOCKS.
EXCELLENT CONDITION

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New portable, diesel powered, "Universal Jr" gravel plant. Also semi-portable washing plant with scrubber, screens, bins and conveyors. Or will crush, wash and screen to your specifications.

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1000—4" Three core pressed steel pallets. Actual size — 3⅞"x15⅝" — Perfectly clean.

MAISEL BROTHERS
Glen Burnie, Maryland
Phone—Glen Burnie 550

Two (2) Besser Super K Tampers

Multiplex Concrete Co., Inc.
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ELECTRICAL MACHINERY

Motors and Generators, A.C. and D.C. for sale at attractive prices. New and Rebuilt. All fully Guaranteed. Send us your inquiries.

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19—6,000 Gal., 8,000 Gal. & 10,000 Gal. Cap. Heavy R.R. Car Tanks with Heating Coils. Immediate Shipment from Illinois, Louisiana, New Jersey and Virginia.

L. M. STANHOPE
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FOR SALE

Gyratory Crusher, No. 7½ Type K, Allis-Chalmers in good condition complete with motor and Vee belt drive. Extra set of new upper and lower concaves. Change in process makes this excellent crusher available.
Also have a skip hoist and lime tank available for immediate shipment.

G. & W. H. CORSON, INC.
Plymouth Meeting, Penna.

BOX CAR LOADER
LINK BELT

Pratt Portable — Size No. 1.

TERRE HAUTE GRAVEL CO.
34th St. and Ft. Harrison Rd.
Terre Haute, Indiana

FOR SALE

Concrete Mixer, Smith 56S, Tilting type, 2 cu. yd. capacity. Condition excellent.

E. E. FORT
1119 So. 56th St. Philadelphia 43, Pa.

FOR SALE

2—135 K.W., AC Generators, direct connected to Fairbanks Morse Diesel engines

• • •

MERTES MACHINERY COMPANY
1622—So. 1st St., MILWAUKEE, WIS.

RAILS NEW AND RELAYING

MOST ALL SECTIONS IN STOCK also spikes, bolts, frogs, and switches available.
Always in the Market to buy surplus material. Send us your inventories.

M. K. FRANK
480 Lexington Ave. New York City — Park Building Pittsburgh, Penna.
Blitz Bldg., Reno, Nevada — Havana, Cuba

FOR SALE

Complete equipment to manufacture 3,000 blocks per day, all machinery like new. Will be sold at a sacrifice.

THE OLIVER MANUFACTURING CO.
1657 Elizabeth Avenue
Rahway, N. J.

MACHINERY FOR SALE

30 Ton Diesel Locomotive—Stdg. Ga.
360 & 600 HP Water Tube Boilers
50 KVA, 3 Ph., Gen. D/C Steam Engine
250 HP, 440-3-60 Cy. Slip Rg. Motor
40 HP Locomotive Type Boiler
84"x140' & 72"x135' Steel Stacks
8—1½ HP GE 3 Ph. Slip Rg. Motors
2—84x20, 140# Pressure HRT Boilers

H. & P. MACHINERY COMPANY
6719 Etzel, St. Louis, Missouri

FOR IMMEDIATE SALE

Rock Crushers:

1—Kennedy-Van Saun 26" Gyratory: Serial No. 1685.
1—Allis-Chalmers Superior McCully 20" Gyratory: Serial No. 8268 (With non-choking concaves recently installed).
3—Telsmith 48" Gyraspheres: Serial No. 6213, No. 6235 and No. 6255.
2—Telsmith 40" x 22" crushing rolls (sand rolls).
1—Symons 3 ft. short-head fine reduction cone.
1—7½ Gates Gyratory.

Rock Screens:

2—Telsmith double-deck 5' x 12': Serial No. 2333 and No. 2334.
2—Telsmith triple-deck 4' x 10': Serial No. 261 and No. 262.
1—Tyrock double-deck 5' x 12', Model F600, Serial No. 3279.
(Large stock of various sizes screen cloth.)

Air Compressors:

1—Ingersoll-Rand stationary 14" x 13".
2—Gardner-Denver diesel portable on rubber tires, Model WBH-365.
1—Sullivan, Model WL-60, Size E, Unitair, 10½" x 5¾" x 5".
All of the foregoing pieces of machinery are complete with adequate size electric motors, starters and switches and with necessary pulleys and drives.

Conveyor Material:

Troughing rolls, return idlers, head and tail pulleys and take-up assemblies in 18", 24", 30", and 36" sizes. Also some stock of new prewar conveyor belting in the same sizes.

Miscellaneous:

3—Gardner-Denver wagon drills.
2—Cleveland wagon drills.
4—Kohler lighting plants: 2000 watt, 110 volt, 18 amp., 1350 RPM, driven by gasoline motors.
1—Winslow motor truck scales, Type P, 20 ton capacity, 24' x 9'.
1—Winslow motor truck scales, 20 ton capacity, 20' x 8'.
1—Ingersoll-Rand Model No. 33 bit sharpener.

Write airmail or wire "REDIMIX" Honolulu.

READY-MIX CONCRETE COMPANY, LTD.
P. O. Box 170 — 320 Ward Avenue
Honolulu 10, Hawaii

FOR SALE

6—4 cu. yd. Hi-Discharge Rex moto mixers, mounted on AC Mack trucks.

Rieth-Riley Construction Company
Goshen, Indiana

FOR SALE—DUMP TRUCKS

3 COLEMAN TRUCKS. Four Wheel Drive, Model X, 7½ Cubic Yard Steel Dump Bodies. Heavy duty hoists. Buda L-525 Engines. All recently overhauled. Trucks ready for heavy work. Good tires with spare 11.00 or 10.50 x 24 for each. Many extra repair parts included. Priced very reasonably at $750 each.

COOLEY BROTHERS, LEHIGH, OKLAHOMA

FOR SALE

1—40 x 22 Diamond roll crusher powered by Caterpillar 13000 motor with 20" x 80' conveyor.
1—30" x 60' portable Pioneer conveyor powered with air-cooled motor (new).
1—24" x 125' Barber Greene conveyor.
4—Euclid crawler wagons with Tu-way hydraulic dump bodies.
1—50 Ton solid tired carry-all.
1—15 ton low bed semi-trailer.

INDIANA SLAG & BALLAST COMPANY
P. O. Box 419 East Chicago, Indiana

FOR SALE

7—Dempster Dumpsters. 4 on Studebaker chassis model 20; 3 on White chassis model 805A. All cab over engine type.

•

GEROSA HAULAGE & WAREHOUSE CORP.
777 E. 138th St., N. Y., N. Y.

15"x38" Telsmith-wheeling Roller Bearing Jaw Crusher. $3500.00.
315 cu. ft. 2-stage overhauls LeRoi portable compressor. $1750.00.
I-R. late model D-2 X-71, wagon Drill. Reconditioned. 10 ft. changes. $750.00 Guaranteed.
Brooks Load Luggers, late model CH-200, 2 yd. buckets. $600.00.
42 ft. center Link-Belt Bucket Elevator. 15" buckets.
20-ton Pitless American Scale.
¾ yd. General Gasoline Caterpillar Crane-Dragline.
M. Wenzel, 2136 Jefferson, Kansas City, Missouri

DIESELS

H.P.	Engines	K.V.A.	Gen.	Year
1000	McIntosh-Seymour	1000	G.E.	1931
750	Superior	600	G.E.	1933
625	Worthington	622	West.	1933
500	Busch-Sulzer	437	G.E.	1920
375	McIntosh-Seymour	372	G.E.	1938
375	Worthington (2)	425	West.	1933
360	Fairbanks-Morse "32"	300	S.M.	1932
330	Gen'l Motors (Winton)	282	G.E.	1937
330	Gen'l Motors (Winton)	282	West.	1937
262	Buckeye "E"	219	Ideal	1938
240	Buckeye "P"	187	Ideal	1932
190	Buckeye "70"	150	E.M.	1940
150	Buckeye "E"	100	G.E.	1937
125	Buda "L.D." (909)(2)	93	Burne	1938
100	International	50	G.E.	1945
50	International	25	E.M.	1945

ROBERT SCHOONMAKER
PORT WASHINGTON LONG ISLAND, N. Y.
PHONE ROSLYN 1220

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EQUIPMENT CORPORATION of AMERICA

WE SERVE 4 WAYS
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CHICAGO'S LARGEST STOCK GUARANTEED EQUIPMENT

MOTOR-GENERATOR SETS

KW	Make	DC	Volts	AC Volts
1000	G.E.	600	Syn.	3/60/2300
1000	Wtg.	275	Ind.	3/60/4100
800	Wtg.	275	Syn.	3/60/13200
750	Elliott	275	Syn.	3/60/440
300	G.E.	275	Syn.	3/60/2200
300	G.E.	275	Syn.	3/60/440
225	Ideal	115	Syn.	3/60/2200
200	Elliott	115	Syn.	3/60/480
200	G.E.	250	Syn.	3/60/2300
150	G.E.	250	Syn.	3/60/2300
100	Cr. Wh.	230	Syn.	3/60/440
100	G.E. 3 wire		Syn.	3/60/480
100	G.E.	250	Syn.	3/60/440
100	G.E.	250	Syn.	3/60/2200
75	G.E.	125	Ind.	3/25/220
75	G.E.	125	Ind.	3/25/440
90	Wtg.	110	75 KVA	3/60/2300
60	Al. Ch.	110	Ind.	3/60/2300
35	G.E.	250	Ind.	3/60/220
7½	Cr. Wh.	125	balancer set	
7½	G.E.	60	Ind.	3/60/440
3	Hertner	65	Ind.	3/60/220
3	Hertner	45	Ind.	3/60/220
3	Lincoln	110	Ind.	3/60/220
2.5	Nwstn.	110	Ind.	1/60/220
2	Elec. S.	750	Ind.	3/60/440
2¼	Wotton	80	Ind.	3/60/220
3 HP	Roth	220	2 KVA	1/60/110
1.6	Wtg.	80	Ind.	3/60/220
1	Holtzer	46	DC motor	220 v.
.5	R & M	115	DC motor	
1/5 HP	G.E.	115	Ind.	3/750/50v.
.2	G.E.	6	DC motor	115 v.
.378	G.E.	110	Ind.	1/60/110

SQUIRREL CAGE MOTORS

3 phase, 60 cycle

HP	Make	Type	Volts	Speed
1000	G.E.	K	2200	509
800	Cr. Wh.		2200	875
700	G.E.	HF	2200	1800
500	Wtg.	CS	2200	1750
350	G.E.	KT	440	1765
300 (3)	G.E.	IK	2200	1750
300	G.E.	IK	2200	900
300	Cr. Wh.		2200	600
250	G.E.	IK	440	1750
200 (3)	G.E.	KTP	2200	1170
200	Wtg.	CCL	440	1200
200 (2)	G.E.	IK	440	1150
200	G.E.	IK	440	580
200	Wtg.	CS	440	600
150 (3)	Wtg.	CS	2200	1750
150	G.E.	IK	2200	1200
150 (6)	Al. Ch.	AR	440	900
150	Wtg.	CS	2200	720
150	Al. Ch.		440	570
150	G.E.	IK	440	575
100	Wtg.	CS	2200	1750
100	Wtg.	CS	440	900
100	Wtg.	CS	2200	870
75	G.E. tot enc	KF	440	3575
75	Wtg.	CS	440	3475
75	G.E.	KT	2200	1800
75 (9)	Al. Ch.	AR	2200	1765
75	Westg.	CS	2200	870
75	G.E.	KT	440	870
75	G.E.	KT	440	870
75	HP Al. Ch.		440	385
60	HP G.E.	KT	440	865
60	Wtg.	CS	220	435
60	Wtg. vert.	CS	2200	1750
50	G.E.	KT	440	600
50	G.E.	KT	440	900
50	G.E.	IK	440	1200
40	G.E.	KF	2200	1745
40	G.E.	KT	220	1745
40	Wtg.	C	440	850
40	Al. Ch.		440	850
40	F. Morse	H	2200/440	720
40	Al. Ch.		440	570
35	G.E.	IK	440	1200
35	Wtg.	CS	2200	1175
35	G.E.	KT	220	900
35	G.E.		2200	900
35	Al. Ch.		440	680
35	Al. Ch.		440	480
30	G.E.	KT	220	860
30	G.E.	KT	440	900
30 (2)	Wtg.	CCL	220	840
30 (2)	Al. Ch.		440	860
30	G.E.	KT	220	600
25	Ideal	AA80	220	1740
25	Cr. Wh.	118Q	440	1150
25	WG. E.	KT326	220	1200
25	G.E.	KT326	220	1200
25	Lincoln	IK	220	900
25	G.E. rl. brg.		220	900
25	G.E.	K-505	440 1740/1150	870/570
25	G.E.	IK	440 1740/1150	870/570
25	G.E.	IK	220 1800/1200	900/520
25	Wtg. elev.	CS	220	575/720
20	Wagner	15VRN	440	1200
20	Al. Ch.		220	850

FREQUENCY CHANGER

1—1400 HP General Electric type ATI-24-1250M-300, form C, 3 ph. 60 cy. 460 volt, 300 RPM, 1570 amps, 1250 KVA, 0.9 P.F. 50° synchronous motor with amort. wdg.; dir/conn. to 1000 KW General Electric type ATI-10-1250M-300, 3 ph. 25 cy. 460 volts, 300 RPM, 1570 amps. 1250 KVA, 0.8 P.F. 50° A.C. generator with amort. wdg., with 33 KW G.E. 125 volt direct connected exciter. (This is a three brg. unit suitable for operation from either end.)

25 CYCLE—MOTOR GENERATOR SETS

1—75 KW General Electric type CL6, 125 v., compound wound, D.C. generator, 2 brg., dir. conn. to 110 HP type I-K, 3 phase, 25 cycle, 230 v., 750 RPM sq. cage motor.

1—75 KW General Electric type DLC-206A, compound interpole, 3 brg. D.C. generator, dir. conn. to 115 HP type I-K, 3 phase, 25 cycle, 440 volt, 750 RPM, sq. cage motor.

SQUIRREL CAGE MOTORS—Cont'd

20	Wtg.	CCL	440	850
20	Al. Ch.		220	860
20	Ideal	A	220	865
20	Cr. Wh.	118Q	220	850
20	Wtg.	CCL	220	850
20	Al. Ch.		440	850
20	Wtg.	CS	220	575
15 (2)	GE	KT	440	1800
15	Cr. Wh.	117Q	220	850
15	West. Elec.		440	900
15	G.E.	IK	220	865
15	F.M.	B	220	900
15	G.E.	IK	220	900
15	Valley	92SP	220	900
15	G.E.	IL	220	720
15	G.E.	IL	220	900
15	U.S.	FRBS	440	600/1200
10	Ryerson friction saw motor	D222	220	3600
10	G.E.	KT	220	1200
7½	Wtg.	CS	220	1750
7½	F.M. vert.	HSZW	220	3600
7½	G.E.	KT30	220	7200

SYNCHRONOUS MOTORS

3 phase, 60 cycle

HP	Make	Type	Volts	Speed
5000	Wtg.	conds.	2300	90
2100	G.E.	ATI	4600	514
3000	Al. Ch.	conds.	2300	900
1000	Wtg.		440	900
750	Al. Ch.		440	1200
750	G.E.	conds.	550	900
500	G.E.	TS	2200	720
500	G.E.	TS	2200	600
500	G.E.	TS	2300	450
300	G.E.	conds.	480	900
270	G.E.	ATI	440	600
150	Burke	S1375	2200	600
100	Cr. Wh.		240	900
75	G.E.	ATB	220	1200
10	G.E.	ATI	240	900
5	G.E. reluctance type	K324	220	1800

A. C. GENERATORS

KW	Make	Type	Volts	Speed
2500	Wtg.	6600		450
1250	Ideal	2200		1200
300	G.E.	480		900
200	Westg.	2400		900
75	Burke	AC16	240	1200
72	F. Morse	AB	440	900
75	G.E.	ATB	230	1200
60	F. Morse	D	2300	300
8	G.E.	ATI	240	900

TRANSFORMERS

KVA	Make	Pri. V.	Sec. V.
3—1000	G.E.	13200	2300
2— 667	Moloney	13200	460
3— 500	G.E.	33000	480
1— 100	G.E. 3 ph.	9000	230
3— 75	Wtg.	3810	244/122
2— 50	G.E.	2200	440/220
1— 20	G.E.	2200	220/440
1— 15	G.E.	1050/2100	2200/288
1— 15	G.E.	2400	120/240
1— 7½	G.E. 3 ph.	2200/3810	220/440
1— 7½	G.E.	1100/2200	220/440
1— 6	Kuhlman	100	20
1— 5	Sorgel	140	220
1— 5	G.E.	1100/2200	110/440
1— 5	G.E.	1100/2200	220/440
5— 3	G.E.	440	110/55
1— 3	Moloney	1150	115/230

DYNOMOMETERS

HP	Make	Type	Speed
200/250	G.E.	TLF-74	1500/3500
50	G.E.	LC	750/2000
25	G.E.	LC (5)	825/2000
40	G.E.	LC	825/2000

D. C. MOTORS

230 Volts

HP	Make	Type	Speed
430	G.E.	MPC-6	950
300	G.E.	MP-8	425
195	G.E.	traction	540/785
150	Wtg.		750
125	Cr. Wh.	CCM	650
100	G.E.	RC	950
100	G.E.	C	1100/1800
100	G.E.	RC-34	2500
75	Wtg.	S-12L	750
50	G.E.	LC dyn.	750/2000
50	Cr. Wh.	51D	650
40	Cr. Wh.	CCM	575
40	W.E.	E60R	620
35	Al. Ch.		850
30	G.E.	RC12	1100
35	Cr. Wh.	CM	840
30	Al. Ch.		575
25	G.E.	Sp. dyns.	825/2000
25	Chandys.		1000
25	Wtg.	S7	850
25	Al. Ch.		700
25	G.E.	CL-6	725
27½	G.E.	CL-6	745
25	Al. Ch.		725
20	Al. Ch.		650

D. C. MOTORS—Cont'd

20	G.E.	RC-13	900
15	Cr. Wh.	CM	800
15	G.E.	CD75	1750
15	G.E.	CVC116	700
15	G.E.	CD83	1150
10	G.E.	RC29	1150
10	G.E.	CD75 (3)	1150
10	Al. Ch.	EE80	1150
10	Al. Ch.	(4)	850
10	G.E.	RC29	850
10	G.E.	RC29	750
10	G.E.	RC13	700

VARIABLE SPEED

D. C. Motors

HP	Make	Type	Speed
100	G.E.	C	1100/1200
25	Wtg.	S9	550/780
25	G.E.	DLC	500/1000
20	Wtg.	SK113	500/1000 (4)
15	G.E.	RC16	500/700
15	G.E.	CE	650/950
14	G.E.	C	700/1400
12	Wtg.	SK80L	500/1000 (2)
10	Elec. Dyn.		600/1200
12½	G.E.	C	700/1400
4	G.E.	C	800/1400
5	Burke	AM12	500/1500
5	Burke	WAM12	650/1950
5	G.E.	BRG	550/850

VERTICAL A.C. MOTORS

HP	Make	Type	Volts	Speed
100	Wtg.	CW	2200	1160
60	Wtg.	CS	2200	1800
35	F.M.	UAV	220	1800
10	G.E.	KT	220	1800
7½	F.M.	bb	220	3600
5	Wtg.	CS	220	850

ROTARY CONVERTER

500 KW Westinghouse, 250 volts DC interpole, 6 phase, 60 cycles, 4100/2300 volts, all complete.

BOILERS

502 HP B & W Stirling water tube ASME, 200 lbs. complete with pulverizer, blowers, fan, etc.

2—800 "Twin setting" B & W Stirling, ASME, 200 lbs. all complete, excellent condition.

2—510 HP Heine straight tube, 200 lbs. less firing equipment.

2—520 HP B & W sectional header straight tube water tube, 200 lbs.

ARC WELDERS

300 ampere, Lincoln's table arc, 50 v. DC 3/60/220 v AC ball b.

500 ampere, Westinghouse, 60 volts DC, 3/60/220/440 volts, AC.

DIESEL ENGINE SET

360 HP F. Morse type VA 6 cylinder, full-Diesel, 14 x 17, 257 RPM, with 300 KVA, 3 phase, 60 cycle, 240 volts A.C. generator, with switchboard, etc.

CHICAGO ELECTRIC COMPANY

1329 WEST 72nd STREET • • • CHICAGO, ILLINOIS

MAXIMUM ECONOMY TIME AND MONEY

LOCOMOTIVE TRACK CRANES
2—Std. gauge, 25 ton Browning, shop overhauled.

GYRATORY REDUCTION CRUSHERS
1—3′ Symons with coarse bowl
1—5½′ Symons with coarse bowl.
1—Traylor, bell head, 10″ feed opening.

BRIQUETTE PRESSES
2—Komarek-Greaves 32″ dia. x 24″ face, rated 25 t.p.h. with extra shafts and rolls.

ROTARY KILNS
3—5′x40′, 5′x48′, 6′x50′, all made by Vulcan Iron Works. Equipped with firing hoods, complete.
1—6′x60′
1—8′x135′ Allis-Chalmers, with 6x40′ rotary cooler.

DIRECT HEAT ROTARY DRYERS
2—5′x40′
1—5′x30′ Cummer, mounted on steel I-beam frame, with furnace, etc.
2—6′x30′ Ruggles-Coles, double shell.
1—6′x60′ Allis-Chalmers "Ebro" type, single shell.

HARDINGE CONICAL BALL AND PEBBLE MILLS
2—4′x6x16″ and 6′x22″, iron lined.
1—5′x22″ iron lined, silent chain drive.
1—6′x36″ silex lined, silent chain drive and motor.
2—8′x30″ silex lined, belt driven.

DORR CLASSIFIERS
2—Dorr Combination Bowl & Rake Classifiers, 10′ dia. with 2′3″x19′8″ rake and 12′ dia. with 2′3″x21′4″ rake.

RAYMOND MILLS
1—4 roll High Side, with air classifier, Raymond exhauster, cyclone collector and inter-connecting piping.
1—4 roll High Side, equipped with whizzer air classifier, Raymond exhauster, cyclone collector connecting piping, etc.

CRUSHING ROLLS
1—24″x40″ Pennsylvania, single roll.
2—18″x18″ Jeffrey, single roll.
2—40″x16″ double-roll, smooth shells.

BELT CONVEYORS
1—30″x24′ long, heavy steel frame, semi-portable.
1—30″x120′ c/c, Rex-Stearns anti-friction idlers; steel frame.
1—30″ approx. 500′ c/c with Jeffrey anti-friction idlers, gear reducer, motor, take-up, etc.
2—Belt Feeders, steel frames, 24″x6′.
1—Robins 24″ Reciprocating Pan Feeder.
2—Portable Belt Conveyors, 16″x25′; 16″x35′, electric motor driven.

VIBRATING SCREENS
8—Tyler Hummer, 3′x5′, 4x5′; one and two decks; also spare V-32 vibrators.
1—4′x10′ Robins, 2-deck.
1—3′x8′ Allis-Chalmers, 3-deck, UNUSED.
1—4′x8′ Huron, 1-deck.
1—4′x12′ Symons, 2-deck.

SHOVELS
1—1 yd. P. & H. Shovel, gasoline, fitted with new crawler treads.
1—Marion 37 electric, 1¼ yd., with Ward-Leonard control.

FOR 35 YEARS A SYMBOL OF CONFIDENCE

CONSOLIDATED PRODUCTS COMPANY, INC.
17-19 PARK ROW NEW YORK, N. Y.
Shops and Yard at Newark, N. J., cover eight acres.

FREIGHT CAR PRICES REDUCED
Now only half of recent peak prices — As low as $500.00
Which of these cars could YOU use?

10—Hopper, Twin, 50-Ton
50—Hopper, Side-Discharge, 50-Ton
10—Refrigerator, 40-Ft., 40-Ton
15—Express Refrigerator, 40-Ft., 40-Ton
10—Box, 40-Ft., 40-Ton
7—Box, Automoobile, Steel, 50-Ft., 50-Ton
2—Dump, Western, Automatic 30-Yd., 50-Ton; lift doors
2—Dump, Clark, 30-Yd., 50-Ton, drop doors
3—Dump, Western, 20-Yd., 40 and 50-Ton; lift doors
4—Dump, K&J, Lift-door, 37-Yd., 50-Ton
50—Gondola, 50-Ton, Low-Side, Composite
10—Tank, 8000 Gallon, 50-Ton

Perhaps this list also has some other cars you could use to very beneficial advantage now?

All cars are priced to sell!

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Iron & Steel Products, Inc.
40 years' experience
13490 S. Brainard Ave., Chicago 33, Illinois
"ANYTHING containing IRON or STEEL"

FOR SALE

16″ Hydraulic diesel elec. dredge Wood hull
16″ Hydraulic diesel elec. dredge Steel hull
16″ Hydraulic Elec. Dredge Steel hull
10″ Hydraulic Diesel dredge Portable Steel hull
15″ Hydraulic Elec. Portable Steel hull
30″ Plain Suction dredge elec. Wood hull
24″ New dredge pump
5-yd. Dipper dredge Steel hull
2—350 cu. yd. Bottom dump scows

H. P. Guion
303 W. 42nd Street
New York City

PRICED RIGHT!

1—Allis Chalmers 9′ x 70′ Rotary Kiln or Dryer, ⅝″ shell.
5—Rotary Dryers, 4′x25′, 5′x30′.
1—American Well Works 1000 gpm Cent. Pump, 2 stage, 125 lb. with Westinghouse 150 HP AC motor.
1—Christie 80″ x 48′ Rotary Dryer, ⅝″ shell.
1—Set of 18″x10″ Crushing Rolls.
1—Blake Jaw Crusher, 9″x15″.
4—Oliver Rotary Filters, 8′ x 10′, 6′ x 6′, 5′ x 8′, 3′ x 2′.
2—Bucket Elevators, 20′ to 75′.
8—Belt Conveyors, 20′ to 50′.
5—Tyler Screens, 3′x5′, 4′x5′.
1—Hardinge 6′ x 4′ Conical Pebble Mill, 30 HP motor.
2—Dorr 15′ Bowl Classifiers.

Partial List Only

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Modern Equipment for Contractors, Quarries, Sand and Gravel Plants, Mines. Complete plants purchased.

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15 ton, 22′x 9′ Truck Scale....$	440.00
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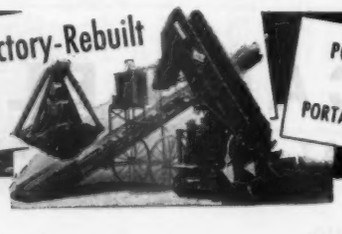

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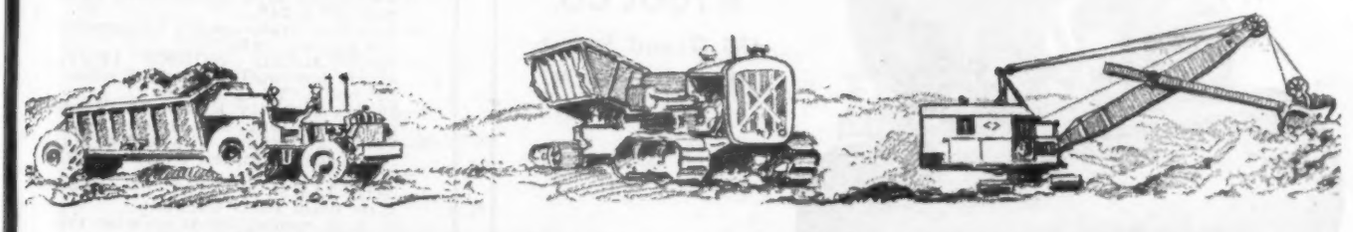

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One—2 yd. Lima 802. Power supplied by Waukesha Hesselman Diesel Engine. 70' dragline boom. 2 yd. dragline bucket. Rebuilt and guaranteed. Pennsylvania.

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One—1¾ yd. Lima 701. 75' Boom. Buda gas engine. 1¾ yd. dragline bucket. Rebuilt and guaranteed. Ready for immediate shipment. Pennsylvania.

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One—1½ yd. Caterpillar Diesel powered Browning and Dragline combination.

2 YARD NORTHWEST MODEL 8 DRAGLINE

One—2 yd. Northwest Dragline Model 2. 75' Boom. 2 yd. dragline bucket.

1¾ YD. MARION SHOVEL-DRAGLINE

One—1¾ yd. Model 371 Marion. Serial number up in 6700s. 80' dragline boom. 23' jib. 16' gantry. Buda gas engine. Complete shovel attachment. In rebuilt condition. New York City.

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One—2 yd. Page Model 411 Dragline. 60' Boom. Two drag buckets. Diesel powered. Midwest.

2 YARD BUCYRUS-ERIE DIESEL 50B

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One—2½ yd. Monighan Walker Dragline. 82' Boom. Indiana.

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Two—3 yd. Diesel Monighan Draglines. Diesel powered. Condition good. Immediate shipment. Indiana.

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One—5¼ yd. Bucyrus-Monighan 4W. 115' Boom. Oversized Diesel Engine. Excellent condition. Pennsylvania.

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Two—5 yd. Bucyrus-Erie 120B Electric Shovel and Dragline combinations with two buckets of 4½ yds. and 5 yds. Shovel boom 32'. Dragline boom 80'. Midwest.

3 YARD MARION ELECTRIC SHOVELS

Two—3 yd. Marion Electric Shovels. 35' Boom. 25' dipper stick. Ready for immediate shipment. Midwest.

A complete selection of Electric Shovels and draglines from ¾ yds. up will be sent on request.

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One—⅜ yd. Ohio Shovel. New England.
One—⅜ yd. Bay City "Pup"—¾ swing Shovel. New England.
One—⅜ yd. Buckeye Crane. Ohio.
One—½-⅝ Yd. Model 33A Lorain. Virginia.
One—⅜ yd. Byers Model 4 Shovel. Kansas.
One—⅜ yd. Byers Bearcat Shovel. Oklahoma.
One—⅜ yd. Universal Shovel. Illinois.
One—⅜ yd. Byers Bearcat Jr. Shovel. Kansas.
One—⅜ yd. Hanson Chain Crowd Shovel. Ohio.
One—⅜ yd. Universal Shovel—¾ swing. Michigan.
One—⅜ yd. ¾ swing Fundum. Michigan.
One—⅜ yd. Very late model Hanson 33 Shovel. Ohio.
One—⅓ yd. Insley Shovel and Backhoe combination. ¾ Swing. Illinois.
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One—⅜ yd. Universal shovel. Pennsylvania.
One—⅜ yd. Universal Shovel. Ohio.
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DUMP TRUCKS

See page 221 for Listings

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One—½ yd. Byers Shovel. Missouri.
One—½ yd. Byers Backhoe Crane and Dragline combination. Missouri.
One—⅝ yd. Byers Bearcat—½ swing. Florida.
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Two—½ yd. Byers Bearcat Cranes. Pennsylvania.
One—⅝ yd. General Diesel Shovel and Dragline. Colorado.
One—½ yd. Rebuilt General Shovel and Crane combination. Up-State New York.
One—½ yd. Hanson Shovel. Ohio.
One—⅝ yd. Insley Shovel. Maine.
One—½ yd. Insley ½ swing Crane. South Carolina.
One—½ yd. Insley Model R — full swing shovel and backhoe combination. Pennsylvania.
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One—½ yd. Buckeye Crane. Ohio.
One—⅝ yd. Meade & Morrison Shovel and Backhoe combination. Maine.
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One—⅝ yd. Northwest Model 2 Shovel. Alamaba.
One—½ yd. Northwest Model 2 Shovel. Kentucky.
One—½ yd. Orton Crane. Up-State New York.
One—⅝ yd. P&H Model 300A Shovel and Dragline combination. Kentucky.
One—Unit Shovel ½ yd. Pennsylvania.
One—½ yd. Unit Shovel and Crane Combination Model 512. Virginia.
One—¾ yd. 1940 Diesel Lorain 40 Shovel and Dragline. Up-State New York.
One—¾ yd. 1939 P&H Model 255 Shovel Dragline-Crane combination. Midwest.
One—¾ yd. Linkbelt Speeder Model B5 Shovel, Dragline and Backhoe combination. Minnesota.
One—¾ yd. Linkbelt Speeder Model B5 Shovel and Dragline combination. Colorado.
One—¾ yd. General Diesel Backhoe and Crane combination. Up-State New York.
One—¾ yd. 20B Bucyrus Dragline, Diesel powered. Florida.
One—¾ yd. Bucyrus 20B gas shovel. Michigan.
One—¾ yd. Bucyrus-Erie 1930. Ohio.
One—¾ yd. 1940 General Shovel and Backhoe combination.
One—¾ yd. P&H Model 204. New York City.
One—¾ yd. P&H Model 400. Michigan.
One—¾ yd. P&H Model 400 shovel and dragline combination. Montana.
One—1 yd. Austin Shovel and Crane-Dragline combination. Michigan.
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Two—1 yd. Bucyrus-Erie Diesel Dragline and Crane combinations. Louisiana.
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One—1 yd. Linkbelt Model K-1. Illinois.
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One—1 yd. Lorain 60A Shovel. Arkansas.
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Ten—1¼ yd. Northwest Model 104. Complete information on request.
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One—1¼ yd. Osgood Shovel Dragline Model 60—heavy duty. Utah.
One—1¼ yd. Osgood Shovel. Up-State New York.
One—1¼ yd. P&H 600. Iowa.
One—1¼ yd. P&H Model 650 Shovel. Wyoming.
One—1¼ yd. P&H 650 combination. Oklahoma.
One—1¼ yd. P&H Model 650 Dragline Shovel combination. Pennsylvania.
One—1¼ yd. P&H 700 Gas Shovel. Arkansas.
One—1¼ yd. P&H Model 700. Michigan.

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1—8 ton VULCAN Standard gauge gasoline locomotive.
1—4½ ton Plymouth 24" gauge gasoline locomotive. Model FL.
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1—INDUSTRIAL WORKS 17 ton steam locomotive crane, 8 wheels, 52' boom. N. B. boiler.
4—50 ton capacity FLAT CARS, std. gauge. 40' long, steel underframes.
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Rock Crushing Plant, 15x38 roller bearing crusher, apron feeder, 42x24" roller bearing rolls, vibrating screen, conveyors, bin, with or without diesel power, 2-unit outfit.

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Compressors mounted on trailers.
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42"	5	1/8"	1/16"
36"	6	1/8"	1/16"
30"	6	1/8"	1/16"
30"	5	1/8"	1/16"
24"	5	1/8"	1/32"
24"	4	1/8"	1/32"
20"	5	1/8"	1/32"
20"	4	1/8"	1/32"
18"	4	1/8"	1/32"
16"	4	1/8"	1/32"
14"	4	1/16"	1/32"
12"	4	1/16"	1/32"

Inquire For Prices - Mention Size and Lengths

TRANSMISSION BELTING

HEAVY-DUTY FRICTION SURFACE

Width	Ply	Width	Ply	Width	Ply
18"	6	10"	6	6"	5
16"	6	10"	5	5"	5
14"	6	8"	6	4"	5
12"	6	8"	5	4"	4
12"	5	6"	6	3"	4

Inquire For Prices - Mention Size and Lengths

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FIRE HOSE

APPROVED SPECIFICATION HOSE
EACH LENGTH WITH COUPLINGS ATTACHED

Size	Length	Per Length
2½"	50 feet	$28.00
	25 "	16.00
2"	50 "	23.00
	25 "	13.00
1½"	50 "	20.00
	25 "	11.00

Specify Thread On Couplings

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RUBBER HOSE

WATER HOSE
Each Length with Couplings Attached

I.D. Size	Length	per Length
¾"	25 feet	$4.25
1"	50 "	8.00
	25 "	6.25
1¼"	50 "	12.00
	25 "	7.50
	35 "	10.50
	40 "	12.00
1½"	50 "	15.00
	25 "	10.00
	35 "	14.00
	50 "	20.00

AIR HOSE

I.D. Size	Length	per Length	Couplings
½"	25 feet	$5.00	$1.50 Pair
	50 "	10.00	1.50 "
¾"	25 "	6.25	2.50 "
	50 "	12.50	2.50 "
1"	25 "	10.00	3.50 "
	50 "	20.00	3.50 "

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4—3' x 5' Hummer Double Deck Screens
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Pumps, all sizes, motor & turbine driven

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¾ cu. yd. Blaw Knox rehandling.
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1 cu. yd. Owen rehandling.
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3 Drum American 100 HP Electric—Separate Swingers
15 Ton Steel Guy Derricks 130' Mast and Boom—Bull Wheels
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Portable and stationary, belt with elec. or gas power, sizes from 20 cu. ft. to 1,000 cu. ft.

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1—Acme jaw crusher, Ser. No. 1686, size 9x16".
1—No. 3 Champion jaw crusher, size 7½x13".
1—United Iron Works, "Blake-type" jaw crusher, size 9½x24".
1—No. 9 New Holland jaw crusher, size 6x9".
1—Sawyer Massey jaw crusher, size 9x18".
1—Allis Chalmers No. 5 gyratory crusher, Ser. No. 5331, opening 10x38".
1—Austin No. 5 gyratory crusher, Ser. No. 2945, opening 12x35½".
1—Crushing Plant, size 1020 Good Roads port., crusher Champion 10x20", elevator, screen, hopper and engine.

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5—Steel guy derricks. 2—20 ton Insley, 115' mast, 100' boom. 2—20 ton American steel guy derricks. 1—110' mast, 100' boom; 1—100' mast, 90' boom. 1—15 ton American steel derrick, 83' mast, 75' boom. 1—5 ton Terry Guy Derrick, 70' mast, 60' boom. 1—5 ton Insley, 75' mast, 80' boom.
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PUMPS (Elect. Centrifugal)

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7—8x6" Worthington, 4 stage, No. 676005W, without power. Capacity 900 GPM @ 875' head.
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1—6x6" Morris, No. 109098, power 100 H.P., 2200-/60/3 slip ring motor. Capacity 1200 GPM @ 240' head. Shut off head 270'.
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Locomotive Cranes, 10 to 40 Ton Cap'y. Steam, Gas, Diesel, Electric.
Locomotives, 6 to 120 Tons, 24", 36", 42" and Standard Gauge, Steam, Gas, Diesel, Electric.
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Wet-Dry Pans, pug mills, Dryer cars, complete
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3-Ton	One 3-Ton International Dump Truck. 1940 Model. Virginia.
3 Ton	One 3-Ton International Dump Truck. Virginia.
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3 Yd.	One 1939 3 Yd. Chevrolet Dump Truck. New York City.
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Acme 12″x24″ jaw crusher
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A-C No. 3D gyratory crusher with short head
Traylor "BULLDOG" 11″ gyratory crusher
Wheeling No. 2½ 9″x15″ jaw crusher
A-C 16″x42″ double roll crusher
Sturtevant Mill laboratory crusher, 5″x7″ rolls
Sturtevant Mill Rotary Fine Crusher No. 0
Midwest No. 2 Hammermill
Simplex coal pulverizer hammermill, roll bearings
Link Belt 24″x24″ Single Roll Spring Relief Coal Crusher
Gruendler No. 16-40 Peerless Grinder
American Standard 24″ Disintegrator
Crushing balls, steel, 1″ to 2″, 8 tons

VIBRATING AND REVOLVING SCREENS

Gyrex double deck 4′x10′ vibr. screen
Allis Chalmers double deck 4′x10′ vibr. screen
Allis Chalmers double deck 3′x8′ vibr. screen
Simplicity three deck 3′x6′ vibr. screen
Leahy single deck 4′x9′ double vibr. screen
Deister 3′x5′ single deck vibr. screen
3 Hummer single deck 3′x5′ vibrating screen
2 Hummer single deck 4′x5′ vibrating screen
Tylers generators for Hummer vibr. screens
Revolving screens: 4′x22′ and 6′x20′
Revolving Conical screen

CONVEYORS AND PARTS

30″ wide trough belt conveyor 125′
Portable trough belt conveyor, 20″x28′
1500′ 48″x8 ply prewar conveyor belt
500′ 30″ 6 ply conveyor belt
New and used conveyor belt
Steel Plate Feeder 47″x30′
Foundry mold type steel conveyor, 42″x160′
L-B 9″ Pitch Steel Apron Conveyor, 24″x18′
Automatic Belt Trippers, 14″ to 18″ belt
Standard 16″ scraper conveyor, 42″ with frame
Screw and gravity conveyors

BUCKET ELEVATORS, CHAINS, PARTS

Bucket elevators with 12″ buckets on chain, 35′-50′
20″ bucket elevator 60′ on 847 chain
Elevator with 6″ buckets on belt, 25′
Elevator with 5″ buckets on chain, 25′
Continuous belt elevator with 13″ buckets, 45′
Continuous belt elevator with 14″ buckets, 40′
Continuous chain elevator with 14″ buckets, 50′
Selected sizes of encased and open bucket elevators
Grain elevators 5″ to 18″ buckets on belt
Elevator chain with attach.: C131, C102½, 825, 847
Conveyor chain: Nos. 114, 124, 730, 2706, H78, 114
New sprockets for RC 120 roller chain
New and used roller chain and sprockets

MISCELLANEOUS

5 Dings magnetic belt pulleys, 18″ and 30″ face, 30″ dia.
Chicago N8B 14″x12″ air compressor, 529 CFM
Chicago N8B 7½″x6″ air compressor, 107 CFM
Gardner-Denver duplex 6″x6″ air compressor
2 speed reducers 60 to 1 and 1800 to 1, 5 hp.
National double drum 25 HP electric hoist
Mead Morrison single drum with swinger, 25 HP electric
Gasoline locomotive 36″ gauge, 4 and 8 tons
Flat and V dump cars, 24″ and 36″ gauge
Waukesha 4 cyl. gasoline engine with 14-1 speed reducer
Waukesha 4 cyl. engine with clutch, 40 HP.
Worthington 25 hp electric pump, 750 gpm, 90′ head
Goulds centr. pump, 4″x3″, 200 gpm, 130′ head
400 HP V belt double pulley drive
Electric motors, gasoline and oil engines.
Vertical pumps, 6″ centr. 25 hp electric, 1000 GPM

G. A. UNVERZAGT & SONS
136 COIT ST.
IRVINGTON, N. J.

FOR SALE

1—McCully Gyratory Crusher No. 9
1—Gates Gyratory Crusher No. 8
1—Jeffrey Swing Hammer Mill No. 1731
1—Jeffrey Swing Hammer Mill No. 1439, 36 x 24
1—5 Ton Plymouth Gasoline Locomotive, Model 2 FL, 48 Gauge
16—End Dump Quarry Cars 48″; 2¼ ton capacity
1—Lidgerwood Electric 2 drum hoist, rope speed 300 FPM
1—Sturtevant Blower Fan No. 7
1—Sturtevant Fan No. 266698—Size 85—Design No. 5
1—Cutler & Hammer Magnetic Pulley, 20″ x 13″, 200 V, A7697A
1—Westinghouse Slip Ring Motor, 11 HP, 1200 RPM
1—Westinghouse C.S. Motor, 7½ HP, 900 RPM, 440 V, 60 cycles double end

A lot of cast elevator drums and cast iron pulleys.

THE J. E. BAKER COMPANY
YORK, PENNA.

FOR SALE

1—200 H.P. Allis-Chalmers Motor, 580 R.P.M. 440 V. 3 P. 60 C.
1—250 H.P. Westinghouse Motor 575 R.P.M. Induction Type, 220 V.
1—150 Westinghouse Motor
1—225 H.P. Allis-Chalmers Motor 580 R.P.M. 2200 Volts
1—Westinghouse Steam Turbine to 375 K.V.A. 2200 V. Generator
1—350 H.P. G.E. Induction Motor 220 Volts
1—200 H.P. G.E. Motor, 600 R.P.M. 440 Volts
1—5 Ft. Radial Drill
1—4 Ft. Radial Drill
1—Planer 25" x 8' x 36" Travel
1—6" Georgia Iron Works Pump and motor

W. M. SMITH & COMPANY
P. O. Drawer 1711
BIRMINGHAM 1, ALABAMA

1—Farrel Bacon 18x36 Jaw crusher
1—Jaeger 7S Model EL Concrete Mixer on 2 Pneumatic tires
1—Jaeger 10S Model EL Concrete Mixer on 2 pneumatic tires
1—Iowa 9x16 Model KD Portable crusher with International Model 20 modified tractor on 4 pneumatic tires
2—Daniels new four wheel rubber tired cable controlled scrapers
3—Southwest new 5 tooth rooters
3—Cleveland new 5 tooth rooters
2—Huber 10 ton 3 wheel rollers latest models with scarifiers
1—Schramm 85 ft. Air compressor on steel wheels
1—Sullivan 85 ft. Model WK312 Air Compressor on 4 solid rubber tires

THE LORENZ EQUIPMENT CO.
CONSTRUCTION and INDUSTRIAL MACHINERY
547 WEST RICH STREET
Columbus 8, Ohio

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14 and 25 Ton Plymouth Standard Gauge Gasoline Locomotives. Automatic air brakes. Electric lights and starter.
300 HP McIntosh Seymour Diesel Generator. Heavy Duty, 60 cy. 2300 volt. Complete power plant.
4' and 5½' Symons Cone Crushers.
2 Yd. Hercules Heavy Digging Clamshell bucket. ¾ yd. Owen.
2 & 3 Drum Gas, Elec. & Steam Hoists. Over-hauled.
10 Ton Guy 40 Ton Stiff Leg Derrick.
24 x 18" American Ring Roll Crusher.
1 Yd. P & H Gas Crane-Dragline-Shovel. Model 600-A.

MISSISSIPPI VALLEY EQUIPMENT CO.
513 Locust St. St. Louis 1, Mo.

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3—5T 30" ga. GE battery locomotives with Edison type C8 80-cell batteries.
1—4T 30" ga. GE with Edison type A5 batteries.
1—30 KW, 160V, DC, MG set with battery charging panel.
1—10 KW, DC Westinghouse MG set with battery charging panel.

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NEW CONVEYOR BELTING IN ROCHELLE STOCK

375' Quaker 36" 4-ply, ⅛ x 1/32" covers
2000' Quaker 18" 5-ply, ⅛ x 1/32" covers
2000' Quaker 24" 5-ply, ⅛ x 1/32" covers
1000' Quaker 20" 4-ply, ⅛ x 1/32" covers
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BETTER ORDER NOW! Manufacturers now quoting 7 Months shipment. Conveyor hardware in stock.

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B-Erie 50B Steam 2 1/3 yd. shovel, 100% rebuilt.
Porter 18-ton & Vulcan 17-ton steam 36" gauge S/T locomotives, 100% rebuilt, tested.
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Whitcomb 8-ton gas locomotives (4), 24" gauge.
Baldwin and Lima steam switching locomotives, 58, 56, 50, 42 & 40 tons, standard gauge.
Plymouth 25-ton gasoline locomotive, std. ga.
P&H 206B crane, gas, 40' boom, ¾-yd. bucket.
American steam railway ditcher-crane, 28' bm.
Draglines, 2 and 3-yd., Diesel, electric.
Fairbanks-Morse 240 HP Diesel engine, Model 41
Cedar Rapids travel type asphalt plant.
Jaw Crushers: 24x50", and 42x40".
Gyratory Crushers: 27" Gates, & 7" Newhouse.
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Bucyrus 30' shovel boom only, for 50B machine.
Boiler tubes, 236—1¾"x5', ferrules, (new).

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Three George vibrating concrete block machines specially built to manufacture (four at a time) 4x8x16 or 5x8x16 or any fraction thereof. These machines are of special value in locations where this size predominates such as in California, New Mexico and Florida. Two machines practically new and one machine still crated.

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FOR SALE

Diesel Engine

1—14x17 four cylinder Fairbanks-Morse Diesel Engine with 170 KW 2300 Volts 60 Cycle 3 phase generator. Price $2600.

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Naranja, Florida

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100 TONS — NEW

SURPLUS STEEL

¼ in., ½ in., and ¾ in.
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CEDAR RAPIDS, IOWA

FOR SALE
TRUCK MIXERS

1 1937 2½ yard Rex.
2 1939 2½ yard Blawknox.
No reasonable offer refused.

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J. A. NICHOLSON
P. O. Box 1644 Toledo, Ohio

Jaw Crushers—4"x8" up to 18"x36".
Crushing Rolls—16"x10" up to 54"x24".
Gyratory Crushers—No. 3, No. 12.
Ring Roll Mills—No. 0, No. 1, and No. 2.
Swing Hammer Mills.
Rotary Fine Crushers—Nos. 0, 1, 1½ and 2.
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Raymond Mills—Nos. 00, 0, 1, 4 & 5 Roll.
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Vibrating Screens—Air Separators.
Lime hydrating plant.
New Dryers built for all purposes.

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1—20 ton Plymouth standard gauge gasoline
1—20 ton Whitcomb diesel 36" gauge
1—57 ton Baldwin type 0-6-0 standard gauge saddle tank
2—67 ton American type 0-6-0 standard gauge separate tenders
2—78 ton Baldwin type 0-6-0 standard gauge side tanks

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New Vulcan 1¼" Hollow Round Wagon Drill Steels with standard lug shanks—Lengths 8 to 22 ft.—Timken and Ingersoll threads—Priced reasonable—Immediate delivery—No priority—Subject to prior sale.

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1—1400 Ft. Sullivan, Belted
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1—440 HP Nordberg, 250 V. DC gen.
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2—125 HP Winton, 240 V. 60 cy. gen.

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1—Sauerman Bros., 2 cu. yd., with tail car tower, 75 HP hoist.
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1—79 ton American 0-6-0 separate tender switcher, built 1920, superheated boiler, piston valves, Walschaerts valve gear, oil burner but can convert to coal, now being rebuilt and brought up to date on all I.C.C. requirements.

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2—26 ton Porter 0-4-0 saddle tanks, standard gauge, built in 1928 and used only 15 months, A.S.M.E. boilers, oil burners, Walschaerts valve gear. These locomotives are in very fine condition and ready to go to work.

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BIRMINGHAM 1, ALABAMA

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1—Universal truck crane on A.C. Mack with pneumatic tires. 30 ft. boom.
2—100 H.P. locomotive type boilers Marion—Model 32 steam power, driving crane.
Single, double & triple drum hoists.

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1—Holder-on, Ingersoll-Rand, Ser. 10739, Size 2
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2—Hammer, rivet, Chicago Pneumatic, Model 80X, Size 1¾"
4—Hammer, holder-on. Chicago Pneumatic, Model 90 Boyer, Size 1¼"
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75—Used Steel-Brooks Load Lugger Buckets; 1½ yds. capacity. V shaped bottoms—rounded, with ring hooks.

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Greundler No. 6X.

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5 Roll High Side.

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36 In. x 20 Ft., 3 Ft. x 30 Ft., 4 Ft. x 30 Ft., 54 In. x 30 Ft., 42 In. x 24 Ft., 5 Ft. x 30 Ft., 5 Ft. x 36 Ft., 5 Ft. x 60 Ft., 6 Ft. x 60 Ft., 6 Ft. x 70 Ft., 70 In. x 40 Ft., 5x30 & 8x84 Double Shell Dryers, 8x110, 7½x100, 8x125 & 10x20 Kilns.

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100—8000 gal. cap. Tank Cars.
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R. C. STANHOPE, INC.

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1—6-Ton Gas Locomotive, 36" Ga. Milwaukee Locomotive Works
1—8-Ton, 0-4-0, Plymouth Gasoline
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1—30-Ton, 0-4-0 Davenport, Diesel
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1—60-Ton, Westinghouse Electric Locomotive, 550 volt, D. C.
2—60-Ton, Baldwin-Westinghouse Electric Locomotives, 1500 volt, D. C.
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1—80-Ton, 0-6-0 Lima Switching Locomotive, T. E. 35,300# Built 1925. Excellent condition.
1—50-Ton, 0-6-0 Baldwin saddle tank loco.

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"ANYTHING containing IRON or STEEL"

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One Model 1030 Good Roads Roller Bearing Crusher

Requires new main shaft

Price as is and where is $750

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FOR SALE OR RENT

1—P & H Model 650 Diesel operated dragline. New 1937 equipment with 50 ft. boom and flood lights. Powered by Caterpillar D-13000 engine. Will handle 1½ yd. bucket. Location Omaha — shipment immediately.

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Rittenhouse 8583

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Allis-Chalmers 5' x 10' Rod Mill, closed end type; gear and pulley drive; Manganese liners.

Allis-Chalmers Double Roll Crushers, Type XX, Size 54" x 24", with new tire steel shells.

Austin Gyratory Crusher No. 107.

Buchanan Type B, 12" x 36", Jaw Crusher.

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1600 Paul Brown Bldg.
St. Louis 1, Mo.

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Worthington-Ransome Blue Brute Distributors

By referring to the advertisement on Back Cover, you'll learn the meaning of the (1), (2) or (1-2) beside their names.

Ala., Birmingham (1) J. D. Pittman Tractor Co.
Ariz., Phoenix (2) Smith Booth Usher Co.
Ark., Fort Smith (2) R. A. Young & Son
Little Rock (1) Kern-Limerick, Inc.
Little Rock (2) R. A. Young & Son
Calif., Los Angeles (1) Garlinghouse Bros.
Los Angeles (2) Smith Booth Usher Co.
San Francisco (2) Coast Equipment Co.
Colo., Denver (2) John N. Meade
Denver (1-2) Power Equipment Co.
Conn., Hartford (2) The Holmes-Talcott Co.
New Haven (1) W. I. Clark
Waterbury (1) Contractors Supply Co.
Del., Smyrna (1) King-Burrous
D. C., Washington (1) M. A. Doetsch Machinery Co.
Fla., Jacksonville (1) Julien P. Benjamin, Inc.
Tampa (2) S. M. Regar
Ga., Atlanta (2) Tractor & Machinery Co.
Savannah (1) Morgans, Inc.
Ida., Boise (1-2) Olson Manufacturing Co.
Ill., Chicago (1-2) Chicago Construction Equipment Co
Chicago (2) John A. Roche
Chicago (1) Thomas Hoist Co.
Ind., Fort Wayne (1) American Steel Supply Co.
Indianapolis (2) Reid-Holcomb Co.
Iowa, Des Moines (2) Electric Eng. & Const. Co.
Ky., Harlan (2) Hall Equipment Sales Co.
Louisville (2) T. C. Coleman & Son
Louisville (2) Williams Tractor Co.
Paducah (1) Henry A. Petter Supply Co.
La., New Orleans (1) Ole K. Olson Co.
New Orleans (2) Wm. F. Surgi Equipment Co.
Maine, Portland (1-2) Maine Truck-Tractor Co.
Md., Baltimore (1) Stuart M. Christhilf & Co.
Baltimore (2) D. C. Elphinstone, Inc.
Mass., Boston, Allston (1-2) Clark-Wilcox Co.
Cambridge (2) W. W. Field & Son, Inc.
Mich., Detroit (1) T. G. Abrams
Detroit (2) W. H. Anderson Co., Inc.
Flint (2) Gransden-Hall & Co.
Muskegon (1-2) Lakeshore Machinery & Supply Co.
Minn., Minneapolis (1-2) Phillippi-Murphy Equipt. Co.
St. Paul (2) D. L. O'Brien
Miss., Jackson (1) Jackson Road Equipment Co.
Mo., Clayton (1-2) The Howard Corporation
Kansas City (1) Brown-Strauss Corp.
Kansas City (2) Machinery & Supplies Co.
St. Louis (2) W. H. Reaves
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Newark (1) Johnson & Dealaman
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N. M., Albuquerque (2) Bud Fisher Co.
Albuquerque (1) Morrow & Co.
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N. Y., Albany (1-2) Milton-Hale Machinery Co.
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New York (2) Air Compressor Rental & Sales
New York (1-2) Hodge & Hammond Inc.
New York (1-2) Railroad Materials Corporation
Olean (2) Freeborn Equipment Co.
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O., Cincinnati (2) Finn Equipment Co.
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Cleveland (2) Gibson-Stewart Co.
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Toledo (1) Edmund Supply Co.
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Okla., Oklahoma City (2) Townsco Equipment Co.
Oregon, Portland (2) Andrews Equipment Service
Pa., Allentown (2) H. N. Crowder, Jr., Inc.
Easton (2) Sears & Bowers
Harrisburg (2) N. A. Coulter
Oil City (2) Freeborn Equipment Co.
Philadelphia (1) Giles & Ransome
Philadelphia (2) Metalweld, Inc.
Pittsburgh (2) Atlas Equipment Corp.
Wilkes-Barre (2) Ensminger & Co.
Wilkinsburg (1) Arrow Supply Co.
York (2) George F. Motters Sons
S. C., Columbia (2) Smith Equipment Co.
Tenn., Knoxville (2) Wilson-Weesner-Wilkinson
Memphis (2) Tri-State Equipment Co.
Tex., Dallas (1) Service Equipment Co.
Dallas (2) Shaw Equipment Co.
El Paso (2) Equipment Supply Co.
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Houston (2) Dye Welding Supply Co.
Houston (1) McCall Tractor & Equipment Co.
San Antonio (2) Patten Machinery Co.
San Antonio (1) San Antonio Machine & Supply Co.
Utah, Salt Lake City (1-2) Landes Engineering Co.
Vt., Barre (1-2) A. M. Flanders, Inc.
Va., Richmond (2) Highway Machinery & Supply Co.
Wash., Seattle (1) Columbia Equipment Co.
Seattle (2) Star Machinery Co.
Spokane (2) Andrews Equipment Service
Spokane (1) Columbia Equipment Co.
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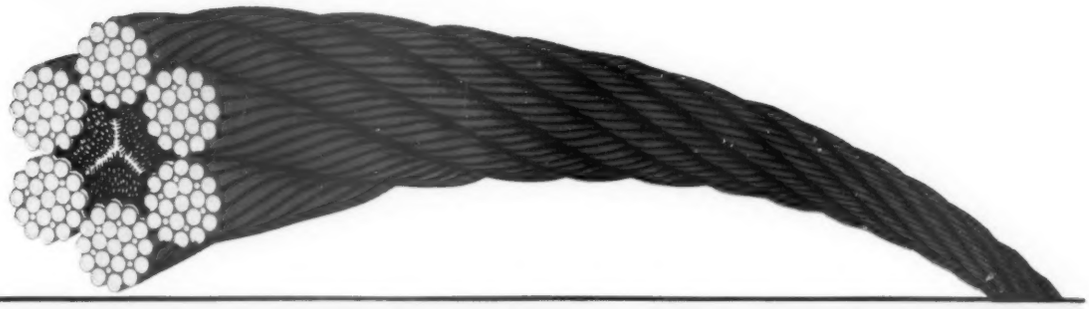
Buy Blue Brutes

Worthington Pump and Machinery Corp.

Worthington-Ransome Construction Equipment Division
Holyoke, Massachusetts



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AMERICAN CABLE DIVISION
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TRADE MARK

In Business for Your Safety

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*Reg. U.S. Pat. Off.

H5-13

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BLUE BRUTES

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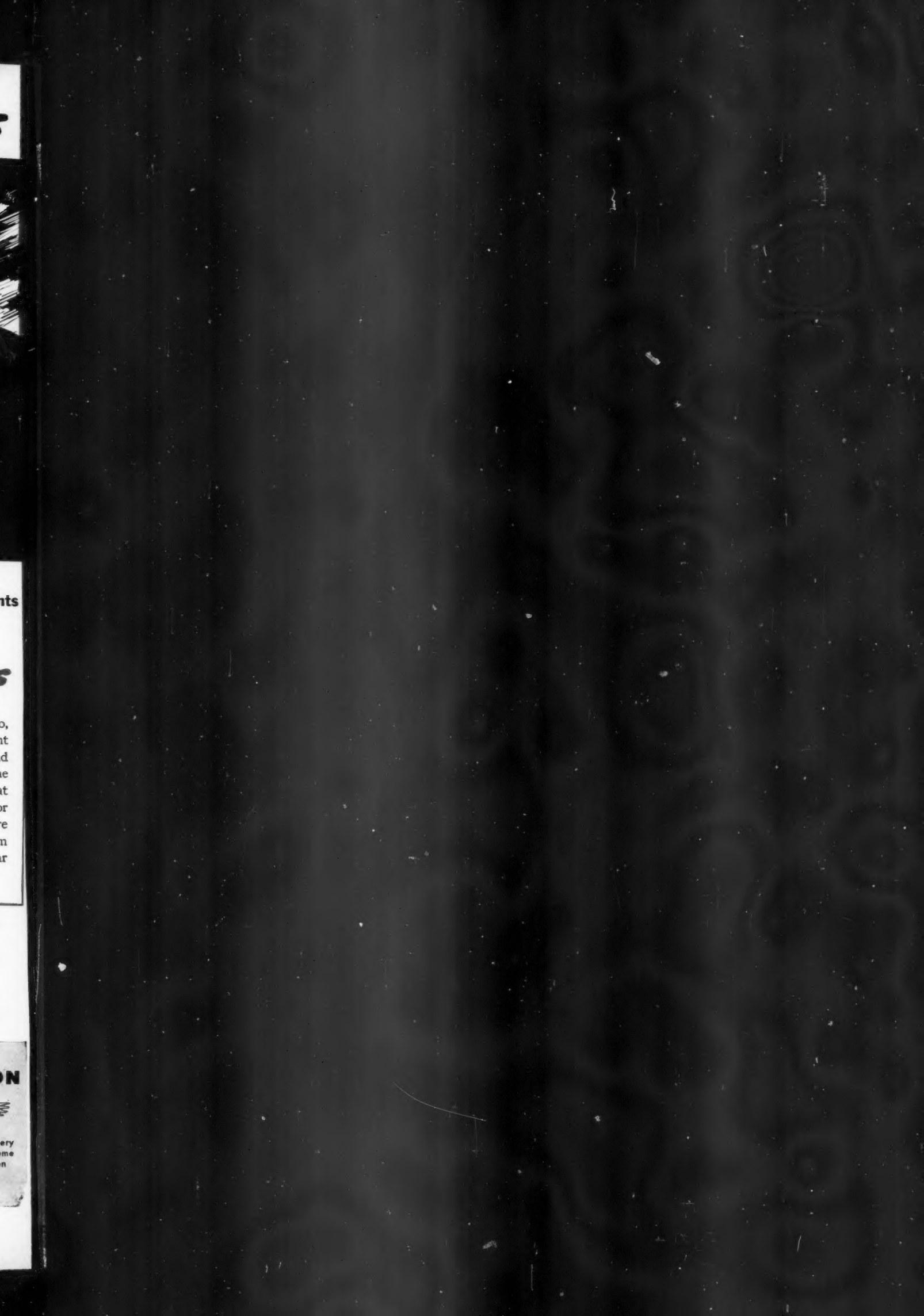
Worthington Pump and Machinery Corporation, Worthington-Ransome Construction Equipment Division Holyoke, Mass.